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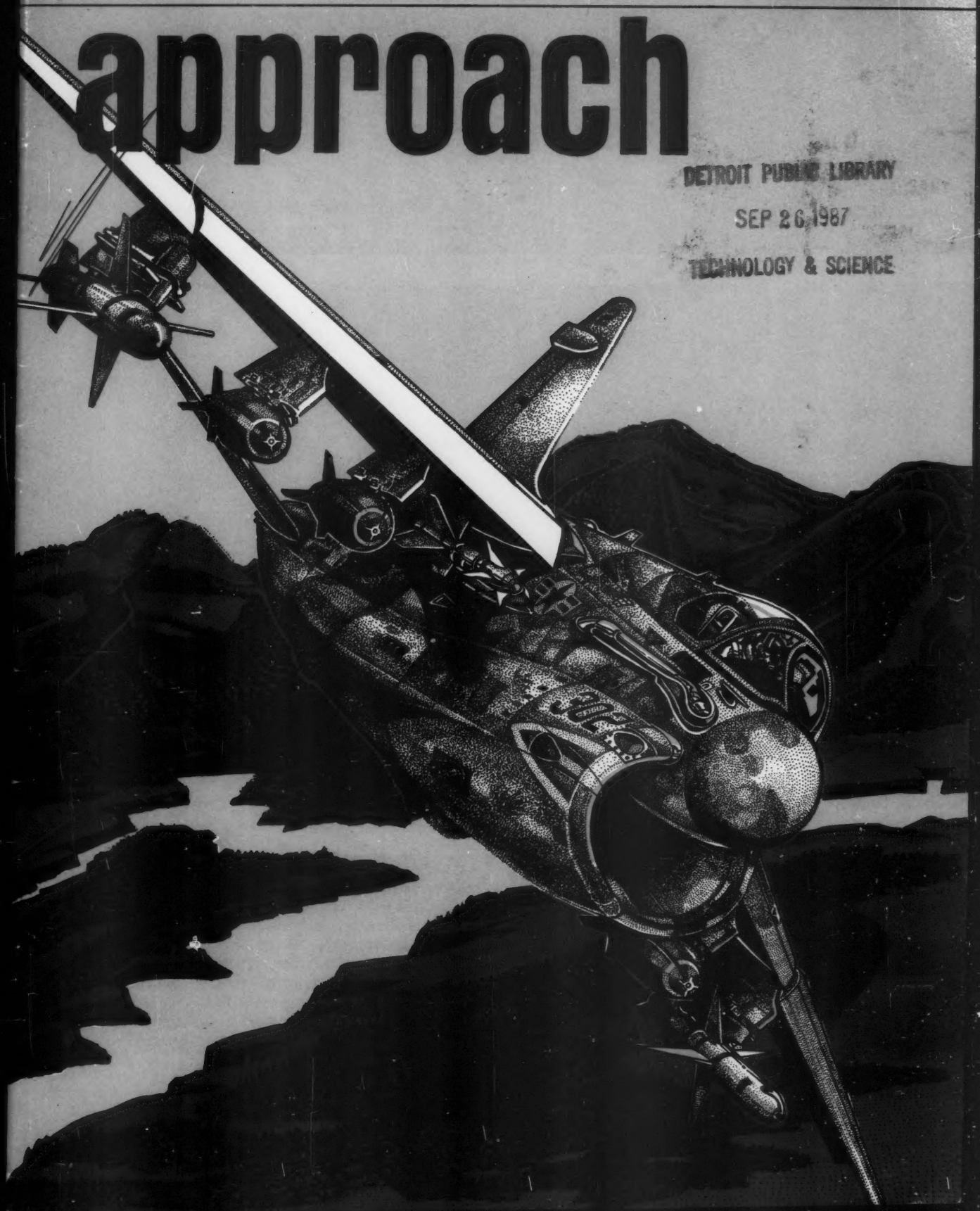

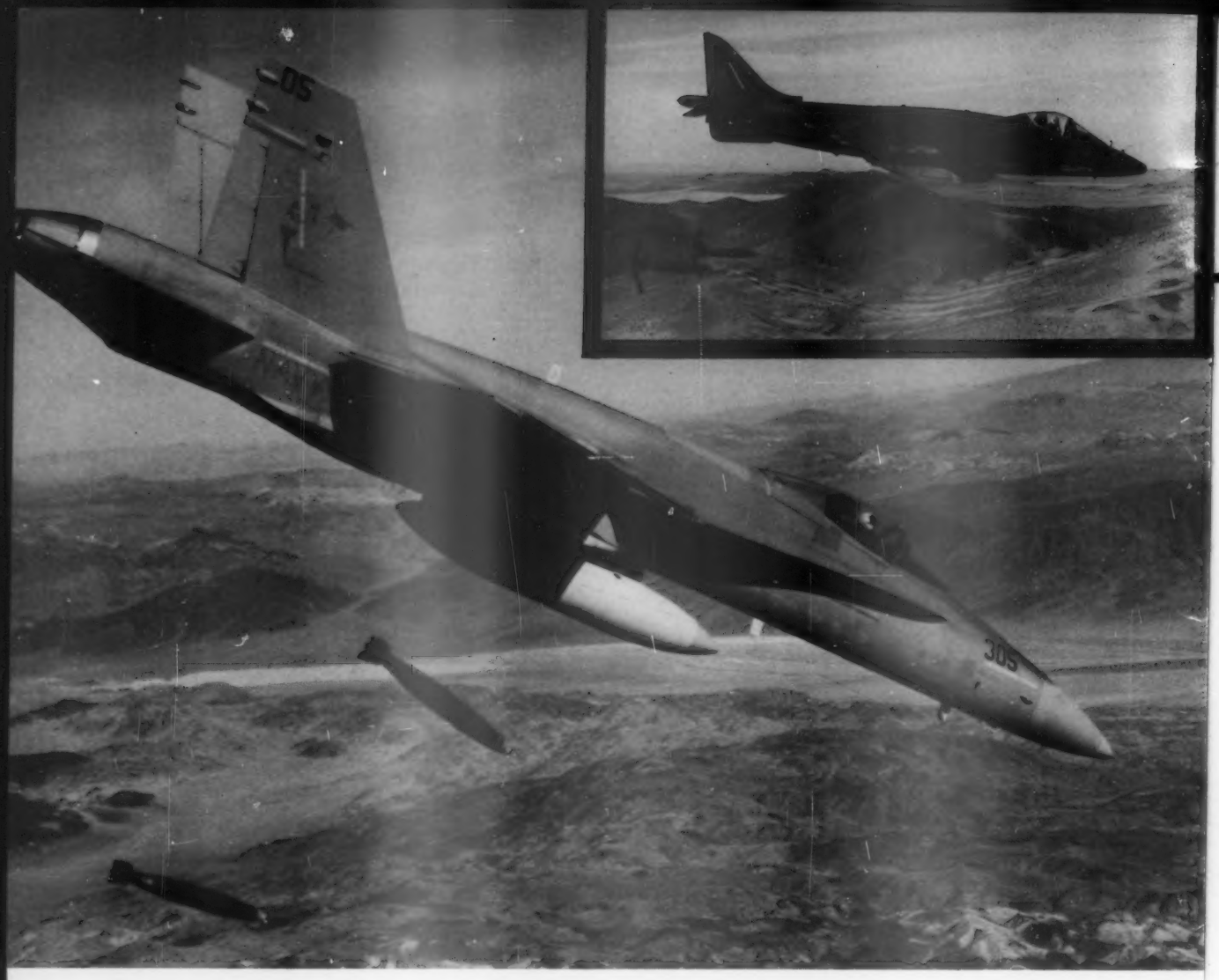

Air-to-Ground

Air-to-ground weapons delivery is one of the toughest missions going. Traditionally, it produces high attrition in combat and relatively higher mishap rates during peacetime training. As our weapons systems become more sophisticated, delivery options become more complex and varied. That makes it even harder to stay proficient. Surprisingly, the phase of the mission when you pull the trigger is less responsible for mishaps than getting to that phase (or leaving it). We brief target fixation and the hazard of flying into the deck, but how much emphasis do we put on the rendezvous, the procedures en route and on the range, and returning to base? That's where most of the mishaps occur.

This issue is devoted to the air-to-ground mission. Whether you fly fixed-wing, rotary, single-seat or multiplaced aircraft, you'll find something in this issue to read and think about. Stephan Coonts, author of the best-selling *Flight of the Intruder*, introduces this issue with a minisequel to his book. On page 2 you can see how Lt. Jake Grafton copes with a particular hazard of night weapons delivery. For a note of humor, cartoonist Jeff MacNelly contributes one of his "Shoe" comic strips with an appropriate theme. Check the rear cover.

LCdr. Dave Parsons
Editor

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Vol. 33 No. 2

Cover illustration of an A-7 on a weapons delivery sortie by Approach artist John W. Williams.

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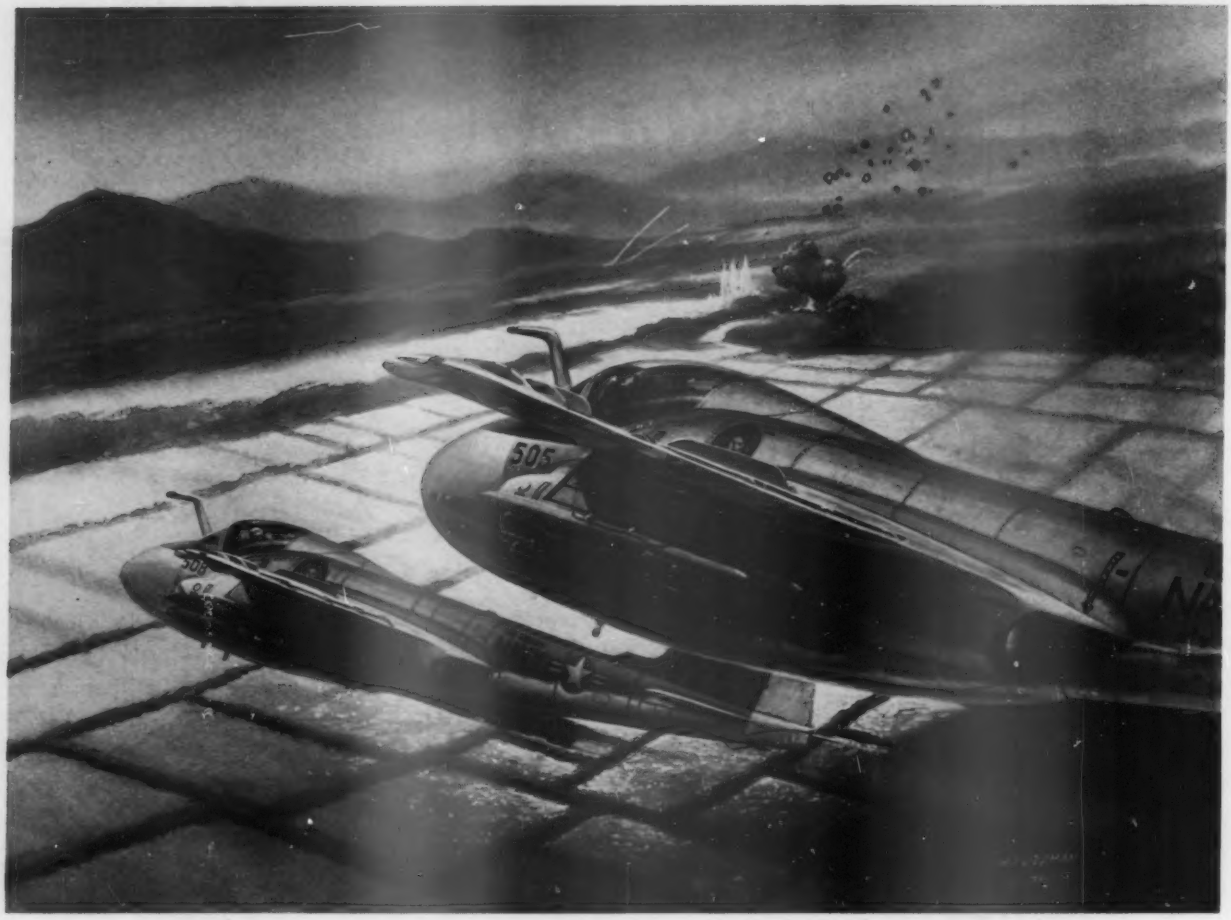

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The World's Greatest Attack Pilot

By Stephen Coonts

We asked best-selling author and former naval aviator Stephen Coonts if he would be kind enough to contribute an article to this issue of Approach. He agreed — and to our mild surprise, we found out this would not be his first appearance in the magazine. We'll let him tell you about it in his own words:

When I was last published in Approach, it was as an anonymous (thank God!) nugget explaining to the world how one goes about landing at the wrong airport. The wrong airport was Fallon Municipal. It turned out I was one of three fools who had done the same thing, though at three different places, and our written confessions with names changed to protect the guilty were published in one article. My skipper told the CAG that a lesser pilot than Coonts would have killed himself landing at Fallon Muni at night, but the CAG shot back that a better pilot wouldn't have landed there at all. I did get a good lesson out of it though, and I'm still alive after 2,000 hours in jets, none of which I ever bent up.

"SAM, what do you think of all these accidents lately?" Jake Grafton was lying on his bunk flipping through Approach. "We were doing real well on the accident rate, then all at once there's a rash of crashes."

Sammy Lundeen leaned back in his desk chair and dolefully regarded his roommate. "All the nonhackers are paying the price. They just don't have the 'pure, righteous stuff,' like I do."

"Cut me some slack. I'm serious."

Lundeen tilted his chair precariously and propped his feet on his desk. "OK; my humble J.O. opinion. Anyone can have an accident if he gets careless, even if just for a little while. You have to be on top of the game every minute in a cockpit. If you let down for any reason, you're asking for the shaft. It can happen to anybody, any time, any place."

"Is that the voice of experience?"

"Yeah," Sammy said defensively. "Yeah. I've made my share of mistakes and almost cashed out a time or two. I'm big enough to admit it. The first few times in the training command, it was ignorance. I just didn't know enough to realize how thin the ice was. But the scariest mistakes were afterwards, in the fleet, when I knew what to do and still got too engrossed in one task, or was too tired and spaced out to get the big picture."

"What was the worst mistake you ever made?"

Sammy shifted uncomfortably in his chair as he rubbed his jaw. "I guess the closest I ever came to the fiery pit was on a night dive-bombing run on Route One in North Vietnam, south of Vinh. We were looking for movers and couldn't find any. For once no one was shooting. When they don't shoot over the beach you get jumpy, edgy. Then we saw this little light right on the road. It looked like a stopped truck. So I figured what the hey and rolled in with four Rockeye."

"And . . ."

"I was so intent on the pipper, I didn't keep my wings level. By the time I figured that out, I was steep, which I didn't notice. Then after I pickled, I waited too long for all the Rockeyes to go. Training them off a third of a second apart, it's a lifetime from the instant you pickle until the last one goes. So when I finally looked at the altimeter, I was going through a thousand feet, 20 degrees nose down; and I still had 12 Mark 82s under the wings and 10 thousand pounds of fuel." Sammy fell silent and waggled his feet thoughtfully.

"But you managed to pull out," Jake prompted.

Lundeen sighed. "It was too late to eject. I pulled 9½ Gs, bottomed out at 50 feet on the radalt. Thought I was dead then and there and had killed my bombardier." He examined the soles of his shoes. One of them had a hole in it. "Man, I shook for days after that one."

"What went wrong?"

"A combination of things. I didn't set the radar altimeter to my pickle altitude to give me a warning. Then I was jumpy waiting for the guns to open up and didn't concentrate on flying a good run."

"So after an experience like that, how come you're always telling people you're the world's greatest attack pilot?"

Sammy's eyebrows rose toward his hairline. "Because I am! You see, after I about made a spectacular 12 o'clock hit, I decided that accidents could happen to anyone who gets complacent, and I mean anyone. Even me. So I stay in shape, get all the rest I can, and when I get into that cockpit, I work like hell until I get out. I don't take anything for granted."

"The grind can be real tough though," Jake admitted. "Especially when it's your second or third flight of the day."

Lundeen nodded. "Other guys might be better sticks than me, they may occasionally get better hits, and they may even have more talent; but no one works as hard as I do at flying. No one works as hard at mastering his art. So I'm going to be there dropping those bombs until the bad guys get me or my plane comes unglued. But I am not going to kill myself!" He flipped his hand. "That's why I'm the world's greatest. I work harder, every flight, every day."

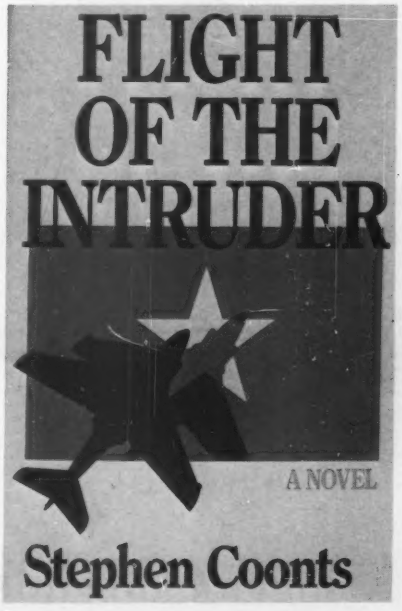
"That reporter, Rucic? He told me a few days ago that the guys who are going to get ahead in naval aviation are the Mister Peepers, guys with zero aggressiveness who fly like they were driving Air Force One."

"The planes cost too much to let hot dogs crack 'em up," Lundeen grunted. "But I still think you can fly aggressively and not have accidents. The secret is to approach every flight, even the most routine, as if it's your solo check ride in basic. Don't let complacency sneak up on you. 'It' may only come out of the sewers every 28 years, but if 'it' latches onto you, you're going to lose a chunk of hide."

"You should have told Coonts about your dive bomb adventure. Maybe he'd have put it in that book about us."

Sammy levered himself out of his chair and headed for the door. "Yeah, like that little scene on the beach with you and Callie. I wonder who told him about that." He chuckled and darted through the door as Jake groped for a flight boot to throw. ◄

Mr. Coonts served as an A-6A pilot in Vietnam in 1971-3, flying from the USS *Enterprise* (CVN 65). He is the author of the best-selling novel *Flight of the Intruder* (U.S. Naval Institute, 1986) which deals with an A-6 pilot in Vietnam.



Red-Tailed Hawk vs.

The visor as it was found in three pieces. Bird remains are very noticeable on the visor.

Green-Tailed Harrier

By 1st Lt. Jerry Dolvin, USMC

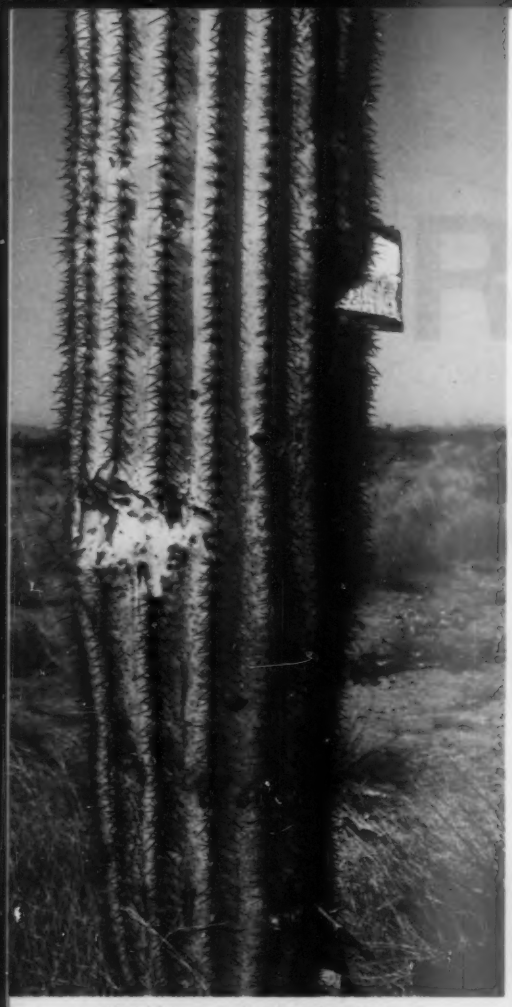
IT was our first deployment to MCAS Yuma with our new AV-8B Harrier IIs. Eight transitioning pilots were scheduled to qualify for their military occupational speciality (MOS). So far, it had been a very successful period, challenging our pilots time and again with the advanced attack package incorporated into the AV-8B. We were beginning to feel comfortable with the operational tempo of the deployment and the warm cloudless skies of the southwestern Arizona desert.

Five or six squadron members gathered at the exchange for omelets and then drove to the hangar for a last-minute cup of coffee. In the ready room, the pilots were constantly studying their TAC manuals and charts. I spent the morning digging in the JMEM (Joint Munitions Effectiveness Manual) and computing weapons release parameters for the target assigned to my afternoon flight. I was also tasked with shadow-graphing the route to the target area with the latest intelligence threats, which I would also brief. I was going to be dash-three of a division wedge, and I was very involved in the flight planning phases of the mission. My CO was scheduled to fly against us as an "aggressor," and he would attack our division at points along the ingress and egress routes.

The flight lead worked his way through the briefing guide, then on to SOP for emergencies: aborts, radio failure, lost sight, bird strike.

"Bird strikes. Predatory birds in the area. Visor down and oxygen mask on. Pull up. Birds usually dive. Landing light on in pattern reduces the risk of bird strikes. If you hit a bird, the first question is can you fly? Next, can the jet fly? Third, what

Initial impact crater. Shows speed and force of aircraft at impact. The crater was almost one mile from the ejection site.



Metal fragments in a barrel cactus.

Helmet as it was found. Note the helmet came off even though the oxygen mask was still attached on both sides.

about the engine? Last, if the aircraft is damaged, what about landing it. Answering 'no' to any of the above means it's time to think about ejection." The brief was finished in an hour.

I was assigned to aircraft 08. The jet was virtually brand-new, with less than 100 flight hours. These new planes were spit and polish; there wasn't a scratch in the paint. When I strapped in and closed the canopy, the aroma was that of a brand-new car. Needless to say, I was feeling pretty good about this sortie.

The bogey took off five minutes ahead of us to find a good perch, and the division started engines at 1615. The post-start and pre-taxi checks were good, and there was plenty of time to watch the heat and hot gases rising from the flight line.

After takeoff, I got a good hack crossing the first checkpoint at 200 feet and 420 knots. The twisting route was designed to stay within the shadow-graphed portions of the threat rings as much as possible. There were threats all along the route and getting to the IP required crossing numerous ridgelines and taking advantage of terrain masking. Ingress was a piece of cake, and I was happy with the progress of the mission. We were on time, the weather was great and the division couldn't be flying better. The wedge accelerated to 480 knots as we headed across the valley toward the IP. Halfway across, lead called, "Bogey, 2 o'clock high, one mile. Closing."

The section leader and I had him in sight, and the wedge initiated a 45-degree hard starboard turn to meet the bogey head-on. At the pass, lead was over a small hill at the tip of the ridge which was our IP. We executed a hard turn 60 degrees to port, heading for the pop-up. My section leader and I followed suit, and the three of us were at 30-second intervals, ears pinned back, heading for the target (a runway). Everything was on time and going great!

Each pilot performed a 20-degree pop-up attack with a right-hand pull on the runway. My assigned target was the northwest third of the runway, and I locked the ARBS system on it. I pickled the bombs, jinked and looked back to a perfectly dissected runway.

Off target, each aircraft egressed at 480 knots and 200 feet, through a saddle back on the mountain. The division lead and section lead did preplanned jinking turns, and the wedge was

back intact less than 30 seconds after I pulled off target. We turned hard right to egress down the eastern side of the ridgeline.

As we started to cross the mountain ridgeline, my section leader saw fluid coming from my aircraft and asked if I was dumping water. (Ed. note: The Harrier uses water injection to increase thrust, especially during warm weather operations.) I checked. The water switch was off, and the gauge indicated 480 pounds. I replied I wasn't dumping water. Both fuel dump switches were off, and the gauges were even.

The division egressed to the southeast corner of the ridgeline. My section leader was on my left, and I was in trail behind the division leader as we approached the ridgeline.

I was preparing to follow my division and section leaders' right turns when an explosion around the canopy blinded me, numbing my entire body. For a fraction of a second, I thought I was dead, but I could still feel the stick in my right hand oscillating fore and aft.

I had a dreamlike vision of the ejection handle as I reached for it with my left hand. I blacked out as I pulled the handle and do not remember anything of the ejection sequence. It seemed like I was sleeping, floating and slowly rotating. I felt a sharp tug around my shoulders and finally came to. Out of the brown haze, I could see one of my hands, and I moved my fingers to see if I was still alive. I blacked out again and impacted the ground on my left side. That brought me back to my senses, and I started moving one limb at a time.

I got to my knees, undid my koch fittings and spread out the parachute. My vision was blurred at a distance, but I could see things close at hand. I found the seat pan and shut off the beeper. There was the sound of a jet overhead, and I could see the dark green color of a Harrier. I pulled out the survival radio and called my section leader on guard, telling him I was OK.

He answered, saying he was initiating SAR procedures. I spread out my aluminum blanket on its reflective side, and collected the day and night flares, popping one smoke to signal my location. After arranging my supplies and equipment, I saw another dark green aircraft and popped another smoke. Then, I saw a silver-colored aircraft and signalled him with my mirror.

Soon after that, I heard the SAR helo coming from the west and told him on the radio I was nearly due east of his position. He came toward me, circling my position clockwise. I popped another smoke, and after the helo landed, a corpsman came out. We walked to the waiting helicopter. I was OK, having survived my first bird strike and ejection.

I never saw the 2½-pound red-tailed hawk that hit my canopy with a force of 800,000 foot-pounds. It paid to have that preflight brief and it paid to have a plan *before* being in this situation. I know constant reiteration of procedures prior to each mission helped me to survive.

For more information on bird migratory routes or statistics on bird strikes, call the Bird Aircraft Strike Hazard team (BASH), Autovon 297-6242, or the Naval Safety Center, Autovon 564-3381.

1st Lt. Dolvin graduated from the University of Cincinnati in 1979 and joined VMA 231 in September 1984. He is the squadron S-2 intelligence officer.

Bird remains and piece of windshield found in the pass through which Lt. Dolvin egressed.

Lt. Dolvin's campsite.

. . . "Wires!" screamed the observer. I hadn't even seen them . . .

Wire Strike!

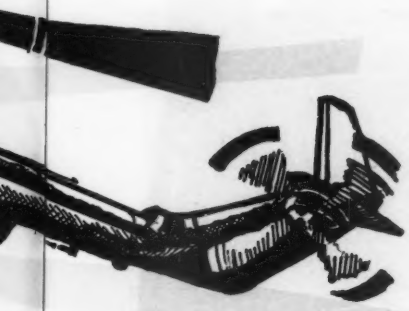
WIRE STRIKE!

The following story was reprinted with the kind permission of ***Cockpit****, the Royal Navy Flight Safety Magazine. LCdr. Sheldon's encounter with high tension wires should be required reading for any Navy or Marine Corps helicopter aircrew planning to deploy to Norway. — Ed.*

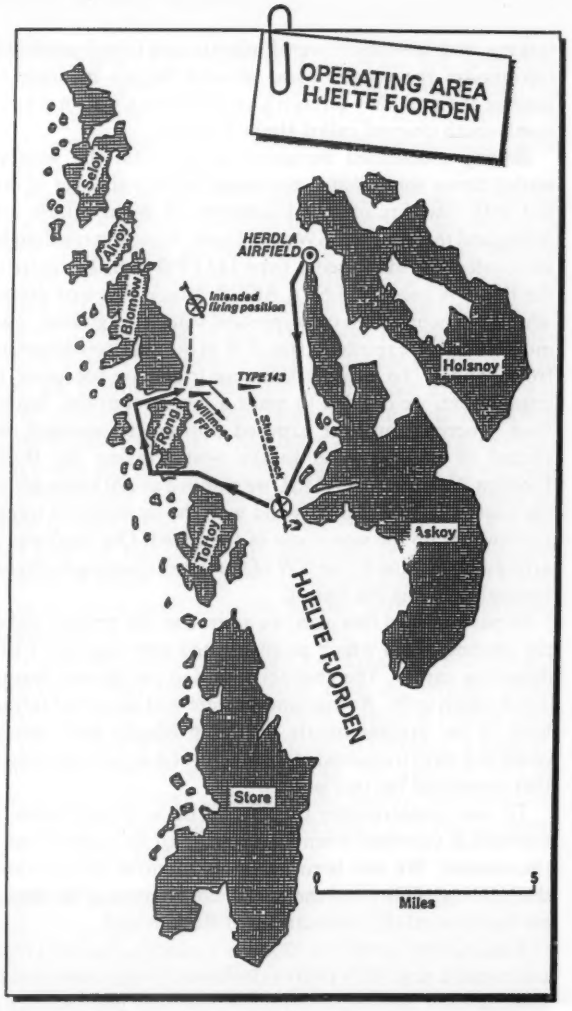
LCdr. P.J. Sheldon is a LYNX pilot and flight commander of 829 BOXER flight.

Last April, HMS BOXER's LYNX suffered a multiple wire strike while on detachment in Norway. Three high tension wires each carrying 20,000 volts with a combined breaking strain of 60 tons were parted. As a result of the incident I, the Aircraft Captain, have been invited to write this article! By doing so, I hope that it may inspire others to reflect upon their role as military aviators who may be called upon in peace or war to fly an aeroplane at low level in close proximity to power cables and pylons. In particular in Norway where such is the environment, then should he overlook the threat of wires for only a minute or even worse fail to see them at all for whatever reason, then he does so at his own peril. I know! I was that man!

HMS BOXER and my Flight were participants in Exercise BOLD GAME 86, an annual NATO sponsored event conducted in the Northern European Command waters. The exercise is designed to familiarise participating units with various tactical concepts by conducting extended Fast Patrol



. . . "I think we're going to die, Phil!" retorted my observer. I think I believed him . . .



Board (FPB) operations. Typical tasking is generally surface reconnaissance and anti-FPB strike — a role well suited to the LYNX helicopter.

Due to a last minute hotel employee strike and a lack of military accommodation in Norway, we were required to operate from RDAF Aalborg in Northern Jutland, some 320 miles north in the Bergen Sea areas. As a result long transits to and from the operating area were necessary.

When FPBs "do battle," their Captains exploit the environment to their advantage like any other fighting unit might. In Norway, in particular, this means that evey fjord, inlet, channel or tiny harbour provides the FPB with the cover he seeks. The task of the LYNX to seek out and engage with SEA SKUA is greatly complicated in this environment.

During such missions normal common sense tempered with "Norwegian flying techniques" applies, but inclement weather and concurrent fighter ground attack serials in the airspace above the operations area, often precludes flying above the terrain level. The ever present risk of skylining oneself for the ensuing FPB gunner's "turkey shoot" requires no further explanation. Aggressive and successful freeplay ASV (Anti-Surface Vessel) both by day and night in often treacherous coastal waters is a significant problem for the LYNX aviator.

At 0725, we took off from RDAF Aalborg on an ASV mission in the coastal sea areas NW of Bergen, Norway. Considerable preflight planning had preceded the launch. Maps were up to date, a comprehensive tactical brief had been given, and a "wire" briefing had been received "face-to-face" with the Norwegian SAR unit at Sola. Norwegian flying techniques had been discussed and the importance of wires and masts in the operating area stressed over and over again. Indeed, several aircraft, including ours, had previously been operating in other Norwegian coastal waters earlier in the exercise and had witnessed firsthand the profusion of wires and masts that existed.

After a one-and-a-half hour transit across the Skaggarak, the aircraft arrived at Sola to refuel. After refuelling, two of us departed, low level, in deteriorating weather to the Bergen operating area for redezvous. Following completion of initial

tasking, both helicopters were further tasked to independently reconnoitre the coastal areas around Bergen in order to sanitise the area. My aircraft's assigned area was in a large north-south channel called Hjelte Fjorden.

Having established ourselves in the area, the weather settled down somewhat. I estimated full cloud cover at 400 feet with visibility of four kilometres. A slight drizzle was falling and the wind was SW at 15 knots. Almost immediately, we located and identified a Type 143 FPB near the centre of the fjord. A successful SEA SKUA attack followed during which we encountered only sporadic simulated gunfire. Two more FPBs were spotted to the NW of our position departing from shelter. To classify them as friend or foe prior to engagement, we decided to make a low-level probe. Rather than proceed from our exposed position to seaward, we elected to make ground to the west crossing the Hjelte Fjorden. From 50 feet AMSL we climbed at 120 knots across the southern tip of Rong Island with the intention to transit northwards up the west coast of the island. Our goal was to arrive at a position to the NW of the targets hoping to remain concealed during the transit.

In pursuance of this plan, we arrived at the western end of the channel from which point we had seen the two FPBs departing earlier. The channel provided an obvious feature down which to fly. At this time we were well above the terrain level of the predominantly low-lying islands and, indeed, could not have transitted at a lower level due to a road bridge that connected the two islands.

To our consternation the two FPBs were not visible to seaward as expected when we approached the eastern end of the channel. We had been unable to monitor their position due to the visibility and the partial obstruction of the land as we had crossed the southern tip of Rong island.

Slowing the aircraft to 60 knots to discuss our next move and a quick scan with radar offered no further clues to their whereabouts. We began to suspect that they had returned to the cover of the channel, when suddenly they came into view. They had seen us, too, and had probably heard us coming for some time. Immediately we were engaged by simulated gunfire.

Evasion was the obvious response. We quickly considered several options. Climb into the clouds going IMC; reverse course and descend, possibly heading into an area of known wires; or descend straight ahead into the channel to regain our cover and still be able to launch an attack. We chose the latter.

We made a rapid visual check of the channel opening and checked our map for any wires or pylons. None was found. The mouth of the channel opening still looked clear. I commenced a gentle descent to get down ultimately to 50 feet. The observer was about to transmit an enemy contact report while cross-checking his map. Just as we approached the mouth of the channel flying at 180 feet, we heard the most awful BANG!! The aircraft immediately pitched nose up and rolled violently to the right. My immediate response was that we had suffered a control malfunction. The shot of adrenalin was almost overwhelming. "WIRES!" screamed the observer. I hadn't even seen them.

Whilst wrestling with the cyclic. I noticed the IAS drop from 60 knots. The most appalling graunching and high pitched whining noise was audible. I sensed that in the cockpit there was a feeling of complete disbelief that this was actually happening to both of us. The relative comfort and excitement of what had been a "cat and mouse" tussle with two. FPBs had become a real life drama of terrible proportions. I managed to arrest the initial pitching and rolling such that I was able to initiate a Mayday call. Instinctively, I lowered the collective fearing that a control surface failure would follow at any

moment. As I did so, flailing wires (I did not know how many) chattered up the windscreen towards the rotor disc. Fearful that they would obliterate the main rotors or pitch control rods, I pulled up the collective. The wires thankfully returned to the base of the windscreen and became tautly stretched across the nose of the aircraft. In addition to these, another wire appeared to be beneath the aircraft, but it was not possible to ascertain whether or not it was actually snagged on the airframe. I had neither the foresight nor the confidence in my ability to retain control to attempt to reverse the aircraft out of the dilemma. I don't know how fast the aeroplane was flying at this stage, but certainly the sensation was one of virtually being in a precarious hover with rapidly deteriorating

yaw control and marginal cyclic control. Only a few seconds had passed since we had first struck the wires, and yet the whole event seemed to be taking place in slow motion.

Suddenly another almighty BANG and both windscreens cracked — mine much worse than the observer's — so much

so that my forward visibility now became obscured. Almost immediately the lower perspex window adjacent to the rudder pedals shattered filling the cockpit with fragments of plastic. It seemed that the aircraft was on the point of breaking up. "I think we're gonna die, Phil!" retorted my observer. I think I believed him. As I hung onto the controls, it seemed that we were completely powerless to do anything and a feeling of hopelessness weighed heavily upon us. The graunching and whining noise was becoming intolerable. For no logical reason other than the desire to do something in an effort to escape from what seemed like a catastrophe, I pulled up the collective. The aircraft pitched nose down and suddenly there was yet another loud BANG accompanied this time with a flash of light. Another BANG followed and the aircraft lurched upwards. At this stage I convinced myself that we had suffered a tail rotor failure since yaw control was becoming more and more difficult. Apparently clear of wires, I now dumped the collective. I communicated my intensions to the observer with a second Mayday call, "376 DITCHING, DITCHING!"

The observer rapidly conducted the crash checks down to the step for Engine Condition Levers-Off. At this point it became apparent to both of us that we would not make the water but rather a rocky foreshore backed by cliffs precluding any kind of engine-off landing. With no time to discuss the problem, I snapped, "PULLING POWER," and gingerly raised the collective. To our great surprise and immense relief, the aircraft responded. A gentle climb was initiated with an equally cautious turn away from the cliffs. Following a brief control check, we located a football pitch on the outskirts of Rong village. With a careful search of the area, an uneventful landing was completed despite marginal forward visibility through my shattered windscreen.

Once safely on the ground, our sense of sheer relief was overwhelming to the point of tears. What had seemed an eternity had lasted only about 30 seconds from hitting the wires to the moment we had broken free. The evidence of our encounter was only too obvious from the damage to the aircraft.

One might now ask, "Why didn't the aircrew see the pylons even if the wires were virtually invisible?" The answer lies in those few ill-fated seconds prior to the incident. We had located and been engaged by "the enemy." During our evasive action our attention had been drawn to the tactical situation and not the real threat — the wires! As we looked through the windscreen in the poor grey light, we did not see any wires or even the pylons. I wonder how much of our attention was really centered on the battle rather than on a thorough and comprehensive lookout. I had fallen into the trap of thinking that it was safe to become more aggressive. Had we not been so preoccupied with the battle, then we would have had no cause to descend so readily into the channel opening in the first place. A 180-degree turn and a safe retreat at the same altitude at which we had first transitted the channel would certainly have been more in accord with the prevailing conditions.

This incident occurred during a NATO exercise in simulated conditions. Had the engagement been in wartime under hostile fire conditions with the FPBs firing real bullets, then the desire to seek shelter in the channel entrance, I suggest, would have been even more pressing. The question of how safe it is to evade such an engagement and by what means in the wire strewn areas of Norway remains a very real problem for the military aviator.

If the unexpected happens
and you need a fast answer
to safety questions, we're ready to help.
Call

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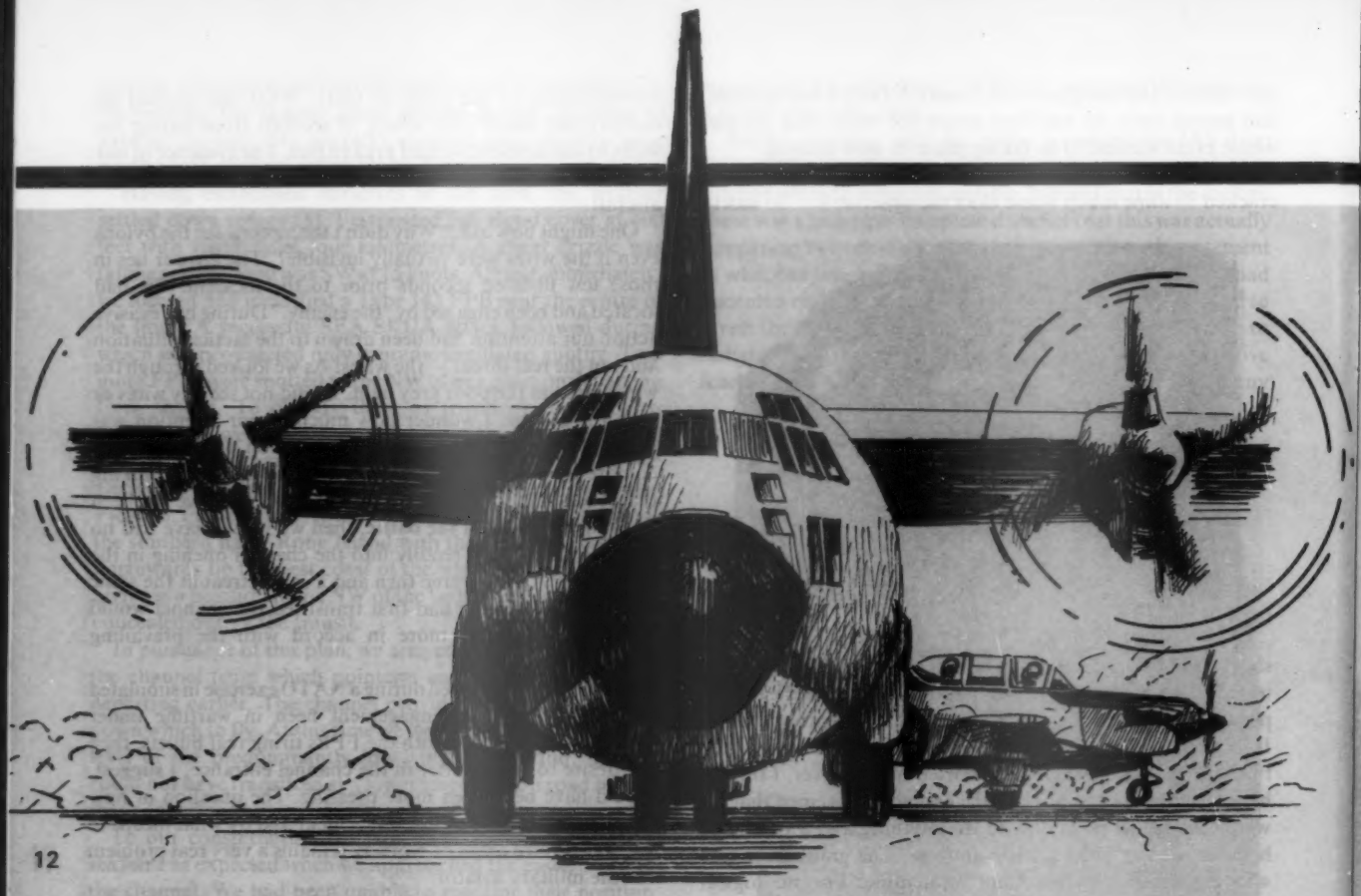
We're the Naval Safety Center, and
this is our 24-hour hot line.
Use it!!!



But You Didn't Tell Me There Was a T-34 Behind Me! The transient USAF C-130 crew manned their Hercules at NAS Lone Star. They were directed to hold short of the runway and to contact clearance delivery. The crew's attention was momentarily diverted as they tried to resolve a problem with their clearance. Both UHF radios were in use, while the VHF was not. To make use of the wait, the C-130 aircraft commander directed the engine run-up but did not advise NAS ground control. He was in an unapproved area for such an activity.

Since ground control could not contact the Herk, clearance delivery relayed the following information: "There'll be a T-34 passing at the left in one minute." The Air Force crew thought the advisory concerned a landing aircraft, not an aircraft in their ground proximity.

But NAS ground had cleared a local T-34C to taxi toward the active and had cautioned the Navy crew about the C-130 holding "between the parallel." As the Mentor approached the Hercules, the instructor pilot (IP) in the back of the T-34 asked ground for guidance in taxiing to the runway, considering the position of the Air Force transport. The controller directed the trainer to use the same taxiway, to go around the C-130, and to tell the controller if such a clearance was impossible.

Although the T-34 IP rogered, he was still concerned about getting around the big four-engined turboprop; he was not aware that the C-130 was going through an engine run-up. While he guarded his wingtip clearance, the IP taxied into the prop blast, which raised the T-34's right wing, making the left wing tip and propeller hit the runway surface. The Navy trainer was blown out of control for a distance of 60 feet.

The T-34 crew advised ground control, requested emergency vehicles and shut down their engine, exiting their aircraft. The C-130 was still not aware of the T-34 until clearance delivery requested them to secure their engines. The Hercules' engines were reduced to idle and then secured.

Primary Pays Off. The P-3 was departing Southeast Muni Airport on a return leg to NAS East. Approaching the active runway 10, the PPC requested takeoff clearance and was instructed to "position and hold." A visual check before taking the runway revealed a Cessna 172 on what appeared to be a final approach for the same runway. The P-3 flight crew requested the tower to confirm "position and hold," and were again instructed to "position and hold." The P-3 flight crew disregarded the instruction and continued to hold short as the Cessna continued its approach to a landing.

AIR BREAKS

Two civilian aircraft had been simultaneously making approaches to runway 10 at the time the P-3 was approaching the hold short area. One was radio-equipped and under tower control. The second was neither radio-equipped nor under control of the tower.

The tower had cleared the radio-equipped aircraft to land; however, the non-radio-equipped aircraft landed first. The tower controller *assumed* this aircraft to be the radio-controlled Cessna 172. It was then that the P-3 requested takeoff clearance and was subsequently cleared to "position and hold." Had the P-3 complied with the tower instruction, an obvious conflict would have resulted in the touchdown zone.

The avoidance of a potential mishap can be attributed to the adherence to basic aviation principles and look-out doctrine.

The lessons learned are many: First, a controller should never assume identification of an aircraft. Positive identification and control are mandatory in assuring the safest environment.

Second, it is easy to take a controller's instruction as gospel. However, this practice could be a fatal mistake. The pilot is ultimately responsible for safety of flight, both in the air *and on the deck*.

Though this type of occurrence is rare, the primary flight training principle of visually clearing the runway environment before positioning the aircraft on the runway is *always* applicable.

Submitted by Lt. Steve Hibbs, Safety Officer, VP 64.

No-dip Herk. The C-130's No. 1 main fuel tank gauge and left external fuel gauge were awaiting repair. After defueling from 45K to 30K for a pilot training event, the aircraft handler signed the register indicating the tanks had been dipped, as required.

During the preflight, the flight engineer (FE) asked maintenance control about the fuel load since the aircraft had a slight right list. Maintenance control checked the register and replied the fuel load was correct.

During taxi, the pilot noted a slight right wing down tendency but wasn't concerned. The FE used fuel management procedures throughout the flight to maintain fuel load symmetry. But while on short final to a full stop landing, the No. 1 engine flamed out. Inspection revealed 3,000 pounds remaining in the No. 4 tank, but the No. 1 tank was *dry*!

What happened? The handler had *not* dipped the tanks. The CO's comments were: "The worker didn't work. The supervisor didn't supervise. Maintenance control didn't control. Then the flight crew accepted the aircraft with an obvious indication that things weren't quite right . . . the aircraft was listing following a defuel operation . . . either the flight engineer or aircraft commander could have broken the chain of events by demanding a new dip of the tanks — but they didn't."

The Whale and the JBD. Following a daytime trap during CQ, an A-3 was taxied behind cat 2 and turned 90 degrees. When the Whale was nearly perpendicular to the JBD, the director signalled the pilot to fold wings and stop. Simultaneously, an F/A-18 on cat 2 went to MRT and was placed in tension. The resulting jet blast over the JBD hit the A-3's folding port wing. The port main mount lifted approximately 3 feet off the flight deck, and the aircraft rolled to the right, resting on the starboard engine nacelle, main mount and nosewheel. The Hornet's launch was suspended, and the F/A-18's engines reduced to idle.

Remember, we're not talking about a small, light aircraft. The CQ operating weight for an A-3 is around 50,000 pounds. CV NATOPS NAVAIR 00-80T-105 cautions not to taxi aircraft with folded wings behind a JBD when the aircraft on the cat is at a high-power setting. Additionally, when launching F/A-18s from a catapult with the MK 6 JBD, as was the case here, Aircraft Launch Bulletin 067B requires a 200-foot clearance aft of the JBD.

We were indeed fortunate. There were no injuries, FOD or structural damage. The mixed bag of aircraft associated with CQ, coupled with JBD restrictions, caught us off guard. Perhaps this inexpensive lesson will cause us to review CV NATOPS and the aircraft launching bulletins. —Ed.

Seagull Commander to Base: Sighted Enemy Aircraft; Bombed Same! Bird strikes are nothing new in the literal sense. However, one of our feathered friends of the sky apparently recently came up with an alternate means of attack.

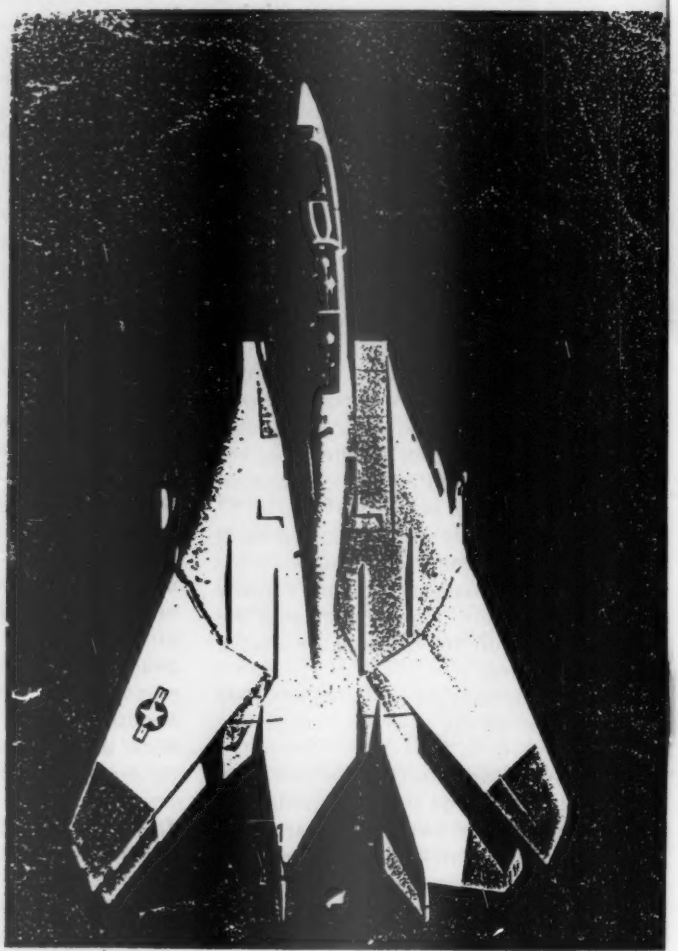
The Navy DC-9 was on a short final to NAS Northeast. The field is right on the water, and thus, is a regular resting place for flocks of seagulls. The aircrew saw approximately eight of the large birds take flight from their position on the runway as the big metal bird approached.

The DC-9 passed beneath one gull that dropped an object. The surprised transport crew saw a *medium-sized clam* strike the center windshield. Postflight inspection revealed no damage.

Someone occasionally says, "It's a jungle out there!" Believe it! Waterside fields are fair game (no pun intended) for large numbers of waterfowl. While most bird strikes are probably not intentional on the part of either the bird or the human aviator, sometimes it seems as if the birds are more diabolical than they first appear. Ever see Hitchcock's movie? — Ed.

Quit Stalling Around

By LCdr. Chuck Scott



A HIGH gross weight A-6 crew overbanks after weapons delivery to observe his bomb hits. A fledgling student naval aviator executes a simulated engine-out low-altitude emergency. A fighter pilot reefs through a high "G" defensive maneuver. They all have three important things in common.

First, they will spend more than half of their lives below 1,000 feet and 150 knots. Second, a critical portion of their flying will be in high-lift conditions characterized by minimum flying speeds. Finally, the basic fundamentals of aerodynamic lift as related to stall speeds seem to be sadly forgotton in too many recent mishaps. Any aircraft's performance in this regime can be accurately predicted and if ignored can place an aircrew into the realm of statistical certainty that the aircraft will depart controlled flight. Let's revisit some of the basic aerodynamic lift characteristics of an aircraft and look at how they contribute to a stall.

A stall is an event where a disruption of the airflow and loss of lift coefficient occurs with a concurrent increase in the relative angle-of-attack of the surface. Since the maximum lift coefficient available corresponds to the minimum controllable airspeed in flight,* this airspeed/stall relationship is a most important point of reference to learn. Knowing the wings-level stall speed of your aircraft and corresponding minimum flying speed is important data; however, knowing those factors that produce a critical variation in the known stall speed of an aircraft can mean the difference between flying or walking home.

The stall speed of an aircraft in level flight varies as a relationship between gross weight (pounds), the aircraft's maximum lift coefficient, wing area (square feet) and density ratio. A large percentage of the maximum gross weight of today's sophisticated aircraft is fuel. Therefore, the gross weight and stall speed will vary greatly throughout a single flight. The effect of weight only on the stall speed can be expressed by a simplified rule of thumb: A 2 percent change in weight will cause a 1 percent change in the stall speed.

As an example, an airplane at 40,000 pounds may have a one "G" wings-level stall speed of 120 knots indicated airspeed. When operating at 44,000 pounds (a 10 percent increase in weight), the stall speed will be 120 + 6 = 126 knots (a 5 percent increase). To the unsuspecting aviator, a relatively minor change in the stall speed due to a change in gross weight (carrying ordnance, in-flight refueling, etc.) can take on added significance if its effect is added to other factors contributing to a change in the stall speed.

Turning flight or dynamic acrobatic maneuvers produce an effect on stall speed that is similar to the effect of weight. Any steady state turn requires that the vertical component of lift be equal to the weight of the airplane and the horizontal component of lift be equal to the centrifugal force (figure 1).

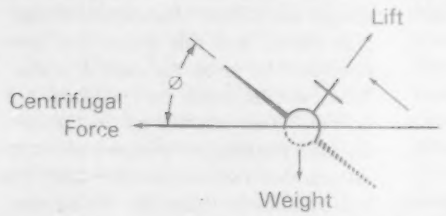


Figure 1. Bank Angle (Ø)

*In some of the newer airfoils, this is not necessarily true.

(Table courtesy of Handbook for Aircraft Accident Investigation NAVAIR 00-80T-6F

BANK ANGLE (Ø)	G's	STALL SPEED
0 degrees	1.00	100%
15 degrees	1.04	102%
30 degrees	1.15	107%
45 degrees	1.41	119%
*		
60 degrees	2.00	141%
75 degrees	3.86	197%
80 degrees	5.76	240%

*Below this line, increase in stall speed and G required increase exponentially.

Table 1. Effect of Bank Angle on Stall Speed

Most important, an aircraft in a steady turn develops a lift greater than actual gross weight and experiences increased stall speeds. The stall speed varies as a relationship of bank angle, load factor "G" and the wings-level stall speed. Two simple formulas pertain to stall speeds in a steady state turn. Load factor "G" = 1/cosine (bank angle) = secant (bank angle). For example: 30 degrees bank angle (1/cosine 30 degrees = 1/.866 = 1.15) is 1.15 "G" for a level steady state turn. Referring to a trigonometric table, the effect of load factor is summarized in Table 1.

The second formula is V (stall angle of bank) = V (stall wings level) times the square root of "G." As an example, our previous 40,000-pound aircraft with a wings-level stall speed of 120 knots develops 1.41 "G" in a steady 45-degree angle-of-bank turn. Multiplying 120 knots by the square root of 1.41 (1.19) gives you 142 knots (119 percent of wings-level stall speed). The effect of angle-of-bank is summarized in Table 1. It is very important to remember that *above 45 degrees of bank angle, the increase in load factor and stall speed is quite rapid.* This fact emphasizes the need for avoiding steep turns at low airspeeds. Add to this the cumulative effects of the unique flying qualities of many of our modern aircraft, such as adverse yaw, sweepback, single-engine flight or split flaps, and you could experience up to a 300 percent increase in the stall speed you are trained to respond to from your last relatively benign wings-level stall series practice.

The implications of precision control at minimum flying speeds and the demands of safe operation in carrier aviation promote the use of high-lift devices. Their purpose is to increase the maximum lift coefficient of an aircraft and reduce the stall speed. While not readily quantifiable, the contribution of these high lift devices can cause a considerable reduction in the stall speed.

A typical jet fighter with a relatively thin swept wing might obtain a 20 percent increase in maximum lift coefficient by full flap deflection. A typical propeller-driven transport may experience a 70 percent increase.

There is a common factor relative to maximum lift and pressure distribution over the wing. Maximum lift of a particular wing configuration occurs at one angle-of-attack (and corresponding aircraft attitude) and one pressure distribution. Load factor "G," weight, bank angle, density altitude and airspeed have *no direct effect on the stall angle-of-attack* (or aircraft attitude).

During flight in high lift conditions such as steep turns, acrobatics, landing and takeoff, the stall airspeed will be determined by weight, load factor, angle-of-bank, configuration and altitude. The stall angle-of-attack remains unaffected. The aircraft will stall once the critical angle-of-attack is exceeded. This is sufficient justification for installing stall warning devices and angle-of-attack indicators; however, the effect of a particular aircraft configuration must be fully understood by the pilot.

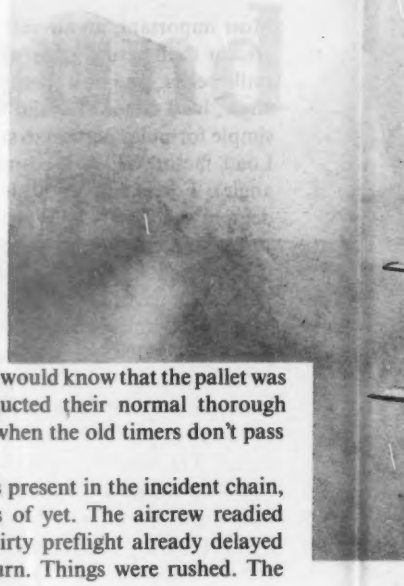
In a recent mishap, an aircraft departed flight in a skidded turn stall to the right while the aircrew was maintaining a "desired" glide airspeed. The aircrew was not warned of the excessive angle-of-attack on the right wing because the stall warning device was mounted on the left wing (optimum mounting location for a standard left-hand traffic pattern). Remember, indicated stall speed can vary considerably in any particular flight condition, but the stall angle-of-attack (aircraft attitude) is unaffected.

Recovery from a stall involves a very simple concept. Since a stall is brought on by disruption of the airflow by excessive angle-of-attack over the airfoil, *the angle-of-attack must be decreased.* This principle must always be considered when high lift coefficients near the maximum are required for high maneuverability, execution of emergency procedures and during landing and takeoff. Aviators must appreciate the effect of the many variables on the stall speed of their particular aircraft. Proper understanding and the use of "ATTITUDE FLYING," angle-of-attack indicators, and stall warning devices will allow for more precise aircraft control under high lift and minimum flying speed conditions. ◄

LCdr. Scott is an investigator with the Aircraft Mishap Investigation Division, Naval Safety Center, Norfolk, Va. Previously he was an F-14 pilot with VF 11 at NAS Oceana, Va., where he was safety officer and operations officer.

"Pallet Away"

"What Pallet?"



By LCdr. Duane J. Phillips

Recently, one of our aircrews inadvertently dropped an empty bomb bay cargo pallet while conducting a simulated torpedo attack. How could something like that happen?

It all started more than two years ago when the NAVAIR 01-75PA-18A2 P-3 Cargo Pallet checklist was published along with guidance on standardizing the construction of these pallets. During our last corrosion inspection, it was discovered that we did not hold this checklist and it was listed as a discrepancy. Consequently, at the time of the incident, the checklist was only the number of a pub then on order, and no one knew what it addressed. Hindsight is always 20-20, isn't it?

Before the checklist was published, we handed down pallet operating procedures like an old karate master passes on his knowledge — by word-of-mouth. When these old sages left the squadron so did their knowledge.

We were on detachment as participants in a major ASW exercise. The first plane was loaded with the O-in-C and ground maintenance personnel plus a cargo pallet that the weekend duty section had installed. What guidelines did the duty section use when hooking up the pallet? Who needed guidelines when the procedure is so simple and routine? They gave it their best shot but failed to notice one of the bomb racks still had its power supply cannon plug installed. This shortfall would enable the starboard side to drop away should a valid release pulse be received. But that was no problem because the pallet would be removed upon the cargo download at the det site, right? Wrong! It was left on the aircraft during numerous ASW training events. Also, there was no VIDS/MAF issued to the aircraft discrepancy book as had been past SOP. The only way an aircrew would know that the pallet was aboard was when they conducted their normal thorough preflight. You sure lose a lot when the old timers don't pass along their knowledge.

There had been lots of links present in the incident chain, but there was no problem as of yet. The aircrew readied themselves for a zero-dark-thirty preflight already delayed due to a low-power engine turn. Things were rushed. The following preflight errors were made:

- The TACCO, newly designated (of course), did not preflight the bomb bay or direct the ordnanceman to cock any racks in preparation for simulated attacks.
- The ordnanceman did not observe the misconfigured bomb rack and failed to inform the PPC or TACCO of *all* stores aboard. The ordnanceman was — you guessed it — experiencing some personal problems at this time; but he was one of the best in the squadron, and a quick pep talk should have made everything all right. Right? Not so in this case. It turned out that his mind was a thousand miles away. Have any of you seen this before but pressed on anyway?
- The second flight engineer who sighted the pallet during preflight failed to inform the senior engineer of its presence.
- The PPC and senior FE did not know the configuration of their aircraft. They assumed that everyone had done their jobs and that all was well.

Takeoff was normal and Condition IV (post-takeoff visual inspection) was performed by Sensor 2 (junior acoustic operator) and reported complete to the flight deck crew. He failed to mention the fact that he had observed a cargo pallet through the inside bomb bay viewing window. Three crew

members visually sighted the pallet and did not mention it to anyone. Why should they when the PPC and senior FE were some of the most seasoned aircrew in the command? They must have known it was there. They were too good to bother with something stupid like the cargo pallet. It sure was nice flying with this kind of talent.

On-station performance went extremely well. They got a Kill Ready light on every attack run. The PPC was happy that the racks were cocked during preflight but did not verbalize this attaboy since things were busy. The TACCO did not key on the fact that there should only be a Kill Ready light on those specific stations he asked to be cocked during preflight. He was grateful that the ordnanceman did it anyway. The ordnanceman was going through the motions and was unaware that the crew was going to lose the pallet soon. The three crew members who actually saw the pallet did not say a word. Do we normally open the bomb bay doors in flight with a cargo pallet installed?

During one of the first attacks, the starboard side of the pallet was released as advertised for its misconfigured state. As each subsequent attack was conducted and the bomb bay doors opened, the pallet bent more and more into the airstream until it finally struck the doors as they closed. This forced the port eye bolts to fail resulting in the entire pallet resting on the closed doors. The next simulated attack proved to be a real one. Two miles from the target, the bomb bay doors were opened. The loose pallet slammed to the rear of the bomb bay, and the subsequent air loads on the pallet caused two 4-inch long tears on the inside bomb bay skin. Once the doors were fully opened, the pallet fell away, fortunately causing no exterior damage. What a splash it must have made!

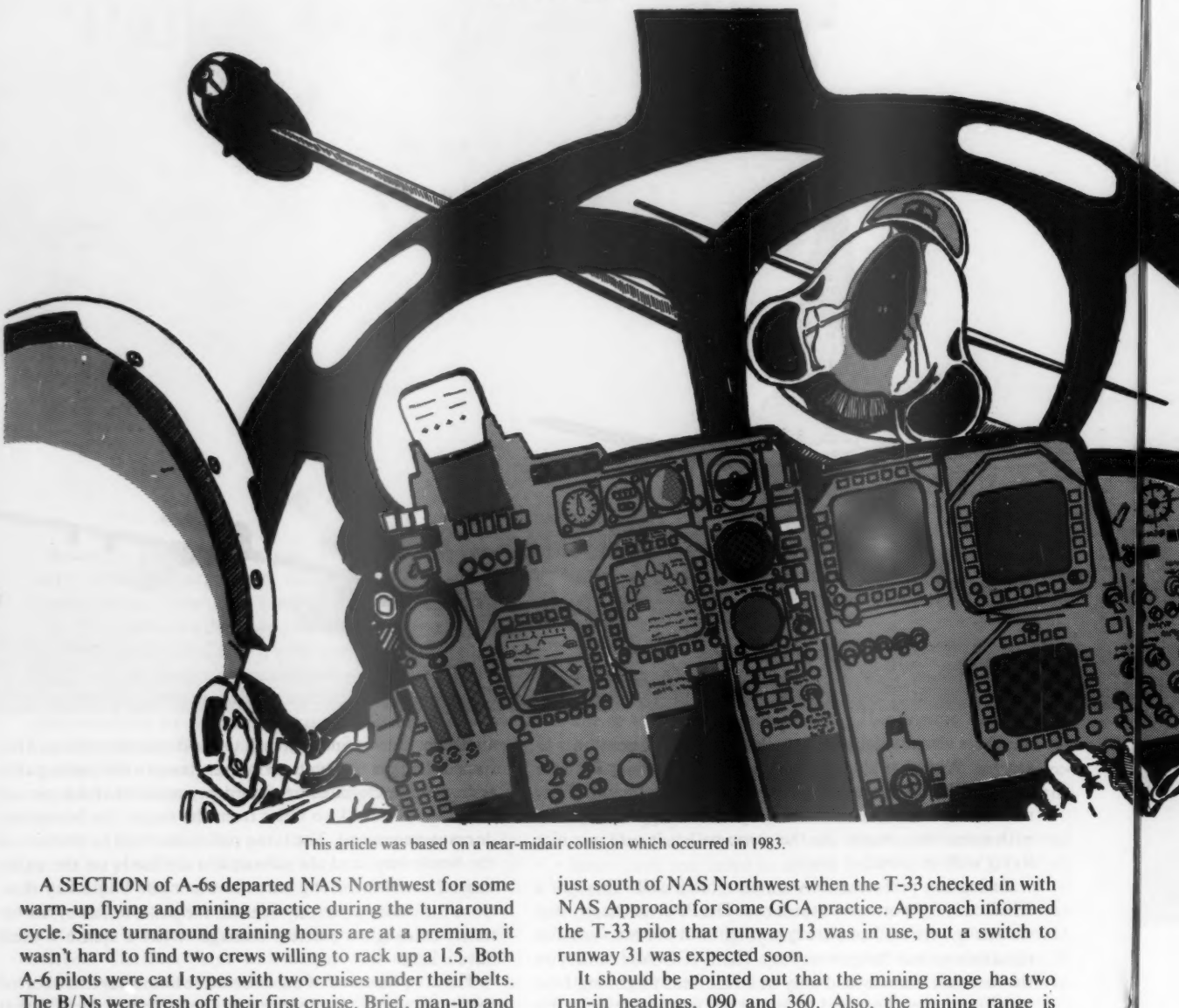
The crew heard all of the noise in the bomb bay and aborted the attack run. The ordnanceman now informed the PPC that the cargo pallet had been released. "What cargo pallet?" he asked. The crew returned home without further incident.

It's not hard to track the links in the incident chain and all the people along the way who could have prevented it. The same links may be present in your squadron and are only waiting for the last one to make it complete. The lessons learned from this incident have applications in everything we do. Is there another tiger waiting to bite? You bet! It's up to all of us to find him before he finds us.

LCdr. Phillips is the safety officer for VP 19.

How to Fit Three Aircraft into

By Lt. A.R. Bougard



This article was based on a near-midair collision which occurred in 1983.

A SECTION of A-6s departed NAS Northwest for some warm-up flying and mining practice during the turnaround cycle. Since turnaround training hours are at a premium, it wasn't hard to find two crews willing to rack up a 1.5. Both A-6 pilots were cat I types with two cruises under their belts. The B/Ns were fresh off their first cruise. Brief, man-up and takeoff went smoothly. The weather was nice; it looked like it would be a fun hop.

Meanwhile, to the south at Northwest AFB, a T-33 was taking off for some instrument flying and approaches to various airfields.

Fresh from "A" school, a new air traffic controller had just manned the console for his turn at directing traffic. He was inexperienced, but it was a nice day and the supervisor was looking over his shoulder. Things seemed well in hand.

The section of A-6s were busy working the mining range just south of NAS Northwest when the T-33 checked in with NAS Approach for some GCA practice. Approach informed the T-33 pilot that runway 13 was in use, but a switch to runway 31 was expected soon.

It should be pointed out that the mining range has two run-in headings, 090 and 360. Also, the mining range is located just to the west of the approach corridor for runway 31. Being on a separate frequency for the restricted area, the section of A-6s never received the runway switch call. The last run on target was on a 360 heading. The wingman dropped his bombs and saw his lead coming up from his 7 o'clock and crossing under to assume the lead.

By this time the runway switch had been completed, and the T-33 was on his second approach to runway 31. The new controller turned the T-33 onto final at 11 miles just as the section of A-6s checked in at the north end of the mining

the Same Hole in the Sky

. . . If the lead A-6 crew had not seen the T-33 at the instant they did, it might well have ended up in the papers as a three-aircraft midair with *five* fatalities. . .

range. This equates to about five miles south of the airfield.

Well, things were busy for the new controller, and with the A-6 check-in, it got busier vectoring them away from the field. The controller gave the section of A-6s a *right* turn to a heading of 100 degrees and an altitude of 2,000 feet. The T-33 was south at nine DME and 2,300 feet. Since the A-6s were at seven DME, they were given a further right call to 130 degrees.

The A-6 crews were *in* the approach corridor to 31, and assumed that they were now on vectors to enter the GCA pattern for runway 13. The T-33 pilot was on final for runway 31.

Almost too late, the controller realized his error, as the blips approached merged plot, and he made a hasty call, "Traffic 12 o'clock, ½ mile!" At nearly the same instant, the lead A-6 crew saw the T-33 just to the right and about 50 feet above them. Lead pushed the nose over hard and broke left. The wingman pushed over too, but saw a blur pass above and just to his left before he could follow his leader. The T-33 pilot had been on a different frequency and commented that he saw one A-6 pass below and to his left. The lead A-6 crew called a near miss to approach without a response.

After two more calls, the obviously nervous controller responded. His voice was immediately replaced by the voice of the supervisor. The lead A-6 crew estimated they missed by 50 feet laterally and 100 feet vertically. Dash Two estimated 100 feet vertically with overlap of the wings. The T-33 pilot was unaware of the proximity of the miss. One reason could be that the A-6 crews observed the T-33 transitioning to the landing configuration (gear in motion). The T-33 pilot was "head's down" in the cockpit, assuring proper landing configuration.

Well, the T-33 continued his approach and then departed for home, still unaware of how close he had come to disaster. In fact, he didn't find out until he was contacted for the investigation. The A-6 crews rejoined, although in somewhat loose formation, and returned to the field.

Upon landing, the lead A-6 crew immediately dashed over to base ops to "talk" to the controller. They learned that the controller was getting to the point of overload when the A-6s first checked in. With their proximity to the field, his first thought was to turn them away, and then set them up for a section approach to runway 31. He **assumed** that the A-6 crews knew of the runway change. In his haste, the controller turned the A-6s right instead of left, and vectored them outbound on the approach corridor.

The T-33 was talking to a different controller, who also failed to see the conflict until too late. Lo and behold, the Air Force and Navy met in the same piece of sky. If the lead A-6 crew had not seen the T-33 when they did, it might well have ended up in the papers as a three-aircraft midair with *five* fatalities.

The moral? Never assume anything. The A-6 crews **assumed** the runway in use was 13. They **assumed** the controller would advise them of traffic. The controller **assumed** the A-6s knew the runway was 31. He also **assumed** the T-33 would be advised of traffic by his controller. The T-33 pilot **assumed** he would be advised of traffic by his controller.

Safe flying is not someone else's responsibility. An ounce of heads-up is worth a pound of radar!

Lt. Bougard flew A-6Es with VA 52 aboard USS *Carl Vinson* (CVN 70). He has been reassigned to London to serve with the British in the PEP program.

It Could Go at Any Time . . .

By Lt. M.D. Guadagnini

A GLANCE at my gas gauge told me it was time to tank right now! After a wild night rendezvous that took 10 extra minutes and an hour of night formation with a load of heavy bombs, my fuel state was right at the no-go point. Finally, it was my turn on the hose. Sweat dripping off my forehead told me that my stress level was way up. As I stabilized behind the basket, the dancing lights of the 24 other aircraft in the formation tugged at my attention. The solid clunk as the probe seated in the drogue was satisfying beyond my wildest dreams; my whole body breathed a sigh of relief.

My exhilaration was short-lived. The tanker was moving around erratically as the pilot tried to maintain his assigned position. "Nothing about this mission is easy," I thought to myself as I furiously worked the stick and throttles to keep the gas flowing. Suddenly, more of the formation came into my field of view as the tanker started a 45 degree angle of bank turn into the gaggle. Anxious radio transmissions blew past my comprehension as I used every ounce of concentration to stay plugged in. First a rapid reversal then the onset of moderate Gs told me something was not right. My B/N's frantic screams of, "Get away from him! Push the stick forward!" were superfluous understatements, since the tanker's tail light was now a mere *six inches* from my canopy bow. A reflexive shove on the stick and a boot full of rudder separated us from the tanker, but as my eyes unglued from the errant KA-6D, I found myself now on a collision course with another division of tanking strike birds.

"C'mon baby . . .," I thought to myself as I yanked on the pole with both hands. I didn't feel the anticipated crunch, but the sickening shudder in the airframe and the violent roll told me the aircraft had departed and I was now falling, tumbling through the night skies.

"510, rejoin the formation **right now**!"

"Sure," I thought, "as soon as I recover from this unusual attitude." I regained control and sight of the lead, then weaved my way through the formation to retake my position on the Skipper's wing.

"Are you OK now, 510?"

"Yes sir," I lied through my sweat-filled mask.

"He's coming back!" screamed my B/N. I looked past the lead to see the lights of the tanker coming towards us with horrific closure. I hung on to my lead literally for dear life as 517 slashed through the strike group, luckily missing all the players.

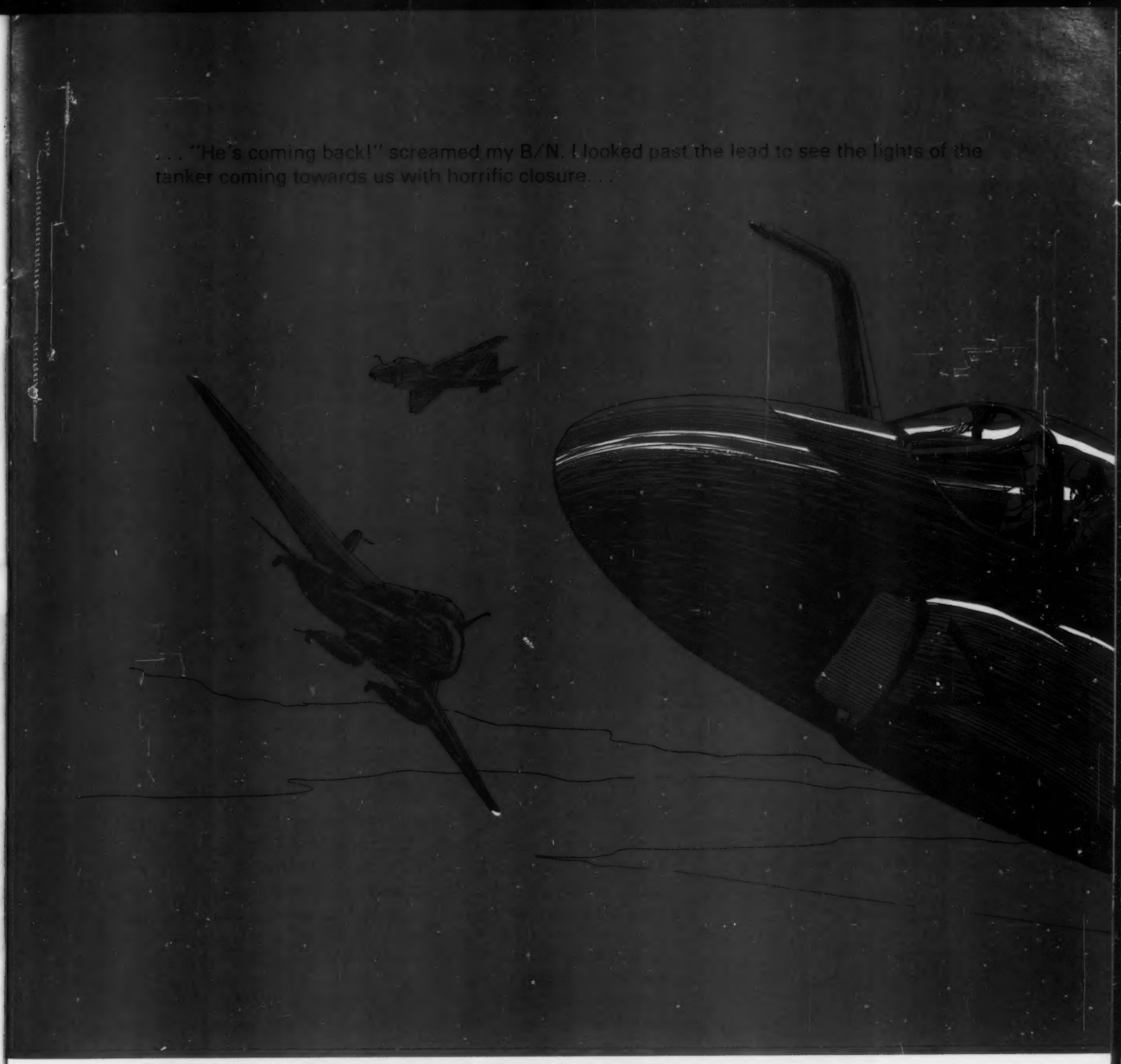
"517, RTB, I repeat, RTB!" yelled the lead. But the departure of the tanker did not cause me to relax. The rest of the four-hour mission was spent white-knuckled as I fought vertigo and tried to hang on through a difficult strike. It took three sliders that night to calm my postflight jitters . . .

We thought the brief had been thorough and covered as many contingencies as possible for a 27-aircraft night launch, but these events proved that no brief can cover everything. The mission was a long-range, night Alpha strike, the largest and most important any of us had been on. Twenty-seven aircrews got launched that night, and although all survived, the safety scoreboard was chock full of near-misses that included: one aircraft diverted with a trailing buddy-store hose, one fire warning light, five near midairs, three low-state aircraft on the ball and 10 pilots with vertigo. Not exactly a "routine" night mission — the fact that no one treated it as such probably averted disaster. The toughest parts of the mission were the night formation and tanking evolutions. There were plenty of lessons learned.

First, the air wing learned that launching tankers before the other aircraft made the strike more efficient for two reasons. The package checkout is accomplished rapidly, so that deck spares can be effectively used or reduced force contingencies can be exercised immediately. A large gaggle executing a night rendezvous presents some serious problems in maintaining aircraft separation and in attaining the correct formation order. From a safety aspect, having the tankers take 1,000- to 2,000-foot altitude splits, with their distinctive green lights serving as guidons greatly reduces confusion as the strike birds rendezvous (especially during EMCON).

Second, external lighting is extremely important. Tomcats look like Christmas trees at night and are extremely comfortable to fly wing alongside. Conversely, A-7s are poorly lit, making extended night formation flights a chore. If one or more lights are inoperative, the resulting light picture can be very disorienting, especially during rendezvous, and can also make extended night formation flying tough. Maintenance control will need some guidance on the repair of "up gripes" written on external lights!

Third, night formation in large strike groups proved to be highly vertigo-inducing. Movement of light in peripheral vision gives the sensation of multidirectional motion, even though the pilot is flying a stable position on his lead. To a point, flying closer is easier, since relative motion is more readily detected and the distortion of the external lights is decreased. Parade position for flights over one hour in duration is much too fatiguing. A modified cruise position, slightly stepped up, was more comfortable and enabled the element leads to keep sight of their wingmen more easily. For A-6s flying formation on the left wing, a position allowing the pilot to view both the port wingtip and fuselage formation lights


. . . "He's coming back!" screamed my B/N. I looked past the lead to see the lights of the tanker coming towards us with horrific closure. . .

through the B/N's front windscreen was the most comfortable. We experimented with separating individual elements of the strike group by one-half to one nautical mile during the enroute phase of the flight, but even experienced pilots found it difficult to maintain relative position — airspeed differentials of 60 knots were noted. However, when the elements flew one-quarter NM or less separation, it was easier to remain in position. Also, the pylon lights on A-6s, KA-6Ds and EA-6Bs can cause pilot fatigue due to their intensity and yellow color.

Lastly, formation tanking is a difficult evolution at best. The movement of each aircraft must be thoroughly briefed, and the basic rules of formation must be followed. The use of pre-briefed light signals greatly reduces the number of confusing radio transmissions. Tanker pilots should be very experienced in both night formation and tanking. Special consideration should be given to selecting pilots who are not normally susceptible to vertigo. While flying formation with receiver aircraft plugged in or attempting to plug, the tanker pilot should strive to remain in a steady position relative to the flight lead. Trying to maintain an exact position with abrupt stick and throttle inputs will make it tough on the receiver aircraft and virtually guarantee vertigo for the receiver pilots. Making slow, small and smooth corrections to a relative position by the tanker is the best course of action.

Lt. Guadagnini flew A-6s with VA 65, and is currently assigned to the U.S. Naval Test Pilot School.

LCdr. Geoff Crawford (left)
Lt. Rex Heminger (right)

LCdr. Geoff Crawford
Lt. Rex Heminger
VF 51

Following a routine 3v2 practice ACM engagement in the Indian Ocean, Lt. Heminger (pilot) and LCdr. Crawford (RIO) were returning to USS *Carl Vinson* (CVN 70). As they decelerated through 350 KIAS, the left oil hot light illuminated, accompanied by a burning odor in the cockpit. Lt. Heminger immediately advanced the left throttle to increase fuel flow and induced a slight sideslip in order to correct the malfunction. Thirty seconds later, with the oil hot light still on, they heard a loud bang, followed by a rapidly rising turbine inlet temperature (TIT) and engine stall warning light on the port engine. Noticing flames coming from the port engine exhaust area, the RIO told the pilot to pull the fuel shut-off handle and secure the left engine as the TIT rose through 1,000 degrees Centigrade.

With the fire persisting, the pilot activated the port fire bottle and the flames were quickly extinguished. Because of severe fluctuations in hydraulic pressure, Lt. Heminger secured the bidirectional pump, extended the in-flight refueling probe, and now faced a single-engine landing aboard the carrier without combined side hydraulics. Assuming the lead for the three-plane formation, the F-14 aircrew completed and rechecked their NATOPS procedures as they set up for a five-mile straight-in approach.

With the ship conducting blue water ops and no divert field available, Lt. Heminger emergency-actuated the landing gear, and flew a perfect *OK* 3-wire pass. Postflight investigation revealed a catastrophic engine failure, with zero oil remaining in the port engine and visible evidence of fire on the outside of the engine case.

BRAVO ZULU

LCdr. Roger Dadiomoff
VC 13

LCdr. Dadiomoff was flying a DACM mission against the A-6 MAWS at Whidbey Island with Cdr. Bill Shurtliff, MAWS, acting as an observer in the rear seat, when their TA-4J's constant speed drive failed. The failure occurred 180 miles from base with the elevator trim in the full nose down position. While heading home, it was discovered the RAT was putting out insufficient power to operate the trim. Shortly thereafter, the airspeed indicator in the front cockpit failed.

Arriving over the field, LCdr. Dadiomoff performed a slow-flight check to determine the minimum airspeed that should be flown on final, which permitted sufficient aft stick authority for landing. With Cdr. Shurtliff reading airspeeds, they determined the approach should be flown at 190 knots. A short field arrestment was to be made in the arresting gear located 2,000 feet down an 8,000-foot runway.

Touchdown was made at 165 knots, approximately 400 feet short of the gear. With an existing forward CG condition, the nose dropped immediately upon touchdown and the hook skipped. LCdr. Dadiomoff immediately applied power; the aircraft began to rotate at 165 knots with full aft stick applied and became airborne with less than 2,000 feet remaining.

Now at emergency fuel, LCdr. Dadiomoff elected to fly the aircraft into the gear. A flawless approach and successful arrestment were made on this attempt. ◄

LCdr. Roger Dadiomoff

From left to right,
LCdr. John D. Maher,
Lt. Kevin G. Williamson,
Lt. Alan F. Johnson,
LCdr. Michael A. Driggers,
Lt. John T. Tierney

LCdr. John D. Maher
LCdr. Michael A. Driggers
Lt. Kevin G. Williamson
Lt. Alan F. Johnson
Lt. John T. Tierney
VAW 124

Two E-2C Hawkeyes had been airborne from their RON airfield for one hour en route to a weapons training detachment. Bear Ace 601 was No. 2 with 603 flying lead at FL 240. Visibility was unrestricted, but a low cloud layer obscured the terrain.

The radar operator, Lt. Tierney, was facing his scope when he heard two faint pops close together and forward of his position. Looking forward through the window in the forward equipment compartment (FEC) door, he saw bright orange flames on the starboard side of the aircraft. The flames reached from the deck to the overhead and heavy smoke began to fill the FEC.

Lt. Tierney immediately notified the Combat Information Center Officer (CICO), Lt. Johnson, who notified the entire crew. LCdr. Driggers, Air Control Officer, called for everyone to don oxygen masks. After he was on oxygen, Lt. Tierney released from his seat, grabbed the portable fire bottle and kicked open the FEC door. He discharged the extinguisher for a 6- to 10-second burst. With the fire apparently extinguished, he shut the door and monitored for reflash.

The pilots had already initiated NATOPS procedures for Fire of Unknown Origin. The pilot, LCdr. Maher, grabbed his oxygen mask with one hand and commenced an emergency descent. The copilot, Lt. Williamson, quickly secured both generators while donning his mask. Thick, white smoke and fumes began entering the cockpit. The pilot dumped cabin pressure. 601 was now operating on its 10 KVA hydraulically driven emergency generator.

All of these actions had taken only seconds. Both pilots then noted the combined hydraulic fluid low-level master caution light prior to losing all electrical power. Only the flight hydraulic system was left at this point. Realizing the emergency generator had failed, the pilot signaled to his lead who had rejoined for a descent.

Using flashlights and hand signals, the copilot communicated with the Radar Operator to select UHF 2 for emergency ICS. Due to extremely

weak UHF sidetones, pilot to copilot communications required hand signals or shouting without oxygen masks.

ATC had informed 603 that the nearest airfield was 12 miles away, but this field was unmanned and had only 3,900 feet of runway. While making a section approach through the cloud layer, 601 lost sight of 603, broke off, and climbed to VFR on top at 8,000 feet. After rendezvous, 603 stated there was another field less than 50 miles away with a 13,000-foot runway. Considering all factors, an approach to the more suitable field was elected. A 210-knot section descent to the field would be attempted. 603 would then break it off and 601 would slow to gear speed. Once again the flight became separated, and 601 was forced to break off the section approach.

LCdr. Maher and Lt. Williamson decided that 601 would proceed alone on a modified surveillance approach. At this time 601's equipment consisted of: a magnetic compass, ball without turn needle, altimeter, airspeed and one UHF radio. While turning toward the field, Lt. Williamson saw a hole in the overcast, and 601 broke out at 600 feet AGL.

With the field in sight, the pilot slowed to a minimum control airspeed of 130 knots to use the landing gear blowdown system. Without cockpit indications, the copilot called the tower and asked for a landing gear check on a low pass. The tower called gear down and locked; however, the crash crew stated the nose gear appeared in trail. After a second flyby, 603 joined and confirmed "three down and locked." With no arresting gear available, LCdr. Maher used differential power and assistance from Lt. Williamson to apply full rudder throw to aid in line up control. The landing was on the money.

Investigation revealed that a chaffed wire bundle had arced to the emergency hydraulic selector valve, resulting in a hydraulic fire, loss of the combined hydraulic system and emergency generator.

Through superior coordination and professionalism, the aircrew minimized fire damage and successfully recovered a crippled aircraft. Innovation and teamwork were the key factors in successfully overcoming a potentially catastrophic compound emergency not covered in the NATOPS procedures.

From left to right,
1st Lt. Dean Triebel
Lt. Grant Shawcroft

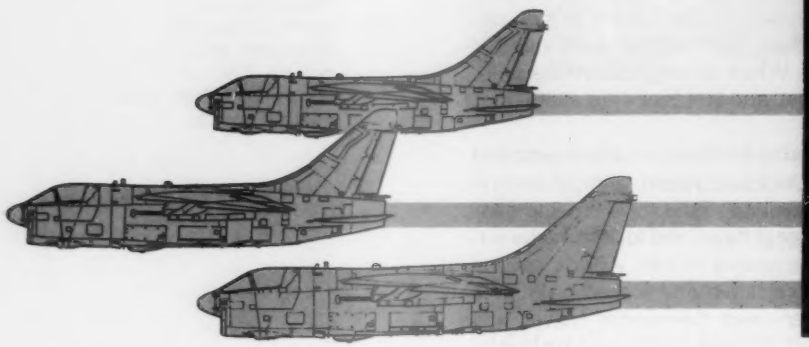
Lt. Grant Shawcroft
1st Lt. Dean Triebel, USMC
HT 8

Lt. Shawcroft (HAC) and 1st Lt. Triebel (SNA) were on the student's first night familiarization flight in a TH-57C. Lt. Shawcroft leveled off at 800 feet AGL, and the student took control. Suddenly there was silence. The engine had flamed out.

Taking control of the aircraft, Lt. Shawcroft immediately entered an autorotation, broadcast a "Mayday" call and turned towards what looked like an open field. Knowing that he had less than 30 seconds between engine failure and touchdown on unknown terrain, Lt. Shawcroft began emergency restart procedures. However, when the engine failed, the generators also failed. The aircraft was autorotating with the cockpit so dimly lit by the battery that the instruments were impossible to read. In near total darkness the relight was completed by 300 feet AGL. 1st Lt. Triebel turned on the landing light on short final. They achieved powered flight at 100 feet AGL and landed safely in a farmer's field. ◄

"Hear No Evil, See No Evil, Speak No Evil"

By Lt. Michael R. McLeod



MIDCRUISE blues — they picked a good name for it. The point where "it's all downhill from here." The hard part is going through all those midcruise safety lectures. It's good to have them, but we are all *professionals* and don't need to go over the same stuff time and again. We listen, nod our heads in agreement, and promise to be safe and not promote dangerous situations. Where's the coffee?

With all the corrosion inspections and reports complete from our last in-port period, it was time to get on with some flying! Day hop went well — dropped what must have been my ten thousandth MK-76, got a touch-and-go trap. Soon I was back in the ready room briefing to be Dash 2 in a night three-plane bomb hop. Where do they get all those MK-76s? Being a conscientious pilot, the lead briefed every aspect of the hop in detail, just like we promised during the safety stand-down. In particular, the dreaded *night rendezvous* was covered thoroughly. Whoever got to the rendezvous point first would set up the circle, and the next two would join in parade, sliding to the outside of the turn. If the lead wasn't the first one at this point, whoever was in the lead would transmit on tactical, "Lead, cross under." At this point the lead could be given to the flight leader from the *left side*, and Dash 2 could balance the formation. We would then start on down to drop our smokes and get set up for bombing.

We manned up, started, taxied to the cats and got airborne. Then we climbed on up and proceeded to the rendezvous point. Thank God I was there first, so Lead and Dash 3 could sweat the join-up. With the power set, altitude hold on and 270 KIAS, I became the lead for the rendezvous.

Getting together took a while since none of us had flown at night for several weeks. Once everyone was aboard, I rolled out on a heading toward a clear area and transmitted "Lead, cross under." No response. "Lead, cross under." A quick glance revealed both planes were still on my right side. "Lead, this is Dash 2, how do you hear?"

I heard, "Loud and clear Dash 2, yeah, uh, my back radio isn't working, I'll be single-radio."

"Dash 2 copies." Another quick glance. Oh! There was an airplane on my left side now, so I keyed the mike, "Lead, you have the lead" and began flying wing as I heard "Roger Dash 2, I have the lead."

Now I was flying form on the plane to my left, just as briefed. Easing back the power I stayed acute. After 20 to 30 seconds of this, I was at idle in a 15 to 20 degree left turn, in a steepening dive with the lead still on my left side. I thought we were getting ready to drop our smokes, wishing the lead would add a little power. I had not looked to the right since the lead change, but I was sure Dash 3 was having as much fun as I was. By then I was dead even, wingtip to wingtip with the plane on my left, trying to fly form and set up my switches to drop the smoke. Why else would we have been in a descending turn at idle passing 8,000 feet?

Then it got interesting. My headset crackled, "Dash 2! Where are you going?" Now I was totally confused for sure. I replied, "Dash 3, go midnight for a second." My worst fears were confirmed when I saw my assumed lead go midnight and rapidly pull up. I followed, looking at my gages and noticed that I had bottomed out of a 20-degree dive at 5,000 feet!

"Dash 3, this is Dash 2, *you* have the lead." As I climbed and set up to rejoin on Dash 3, an ice-cold wave swept over me. I then realized not only what had just happened, but also what had *almost* happened. At this point the real lead realized that he was a lone plane, and we all called our positions from mom. Dash 3 and Dash 1 were 10 miles from the lead, going in the opposite direction and climbing. The flight eventually got back together (in proper order) and finished the mission. Back in the ready room, I had time to reflect upon the events of my eventful night hop. Dash 3 said I was in position with Dash 1 for about 30 seconds after the lead changed, which is pretty scary if you consider the fact that I never even looked in that direction. In the dive away from Dash 1, Dash 3 thought I had experienced an engine failure or other major problems. A simple lead change had turned into a potential class A mishap.

Although it had been briefed in detail, some variables had entered the equation. First, the flight lead was basically NORDO for a few seconds due to his radio problems and never heard the transmissions to cross under. When nothing happened, Dash 3 crossed so that the flight lead could take the lead from the right side. Unfortunately, it wasn't briefed that way, and the flight lead tried to take the lead from the *right side.* Dash 3 realized something was not right as Dash 2 turned away from Dash 1 and began a rapid idle descent. Only pure luck prevented the entire scenario from culminating with a midair or an aircraft impacting the water.

As usual, after the fact we can look back, analyze our errors and clearly see the factors that led to the incident. Although the entire evolution was briefed in detail, the momentary radio loss experienced by the *real* flight lead, coupled with Dash 3's unbriefed crossing to port, set the stage for near disaster. By crossing under to help out Dash 1, Dash 3 appeared to be Dash 1, and the real lead was thrown out of the equation with a radio malfunction. It was frightening to imagine flying close formation at night while looking away from the lead for 20 to 30 seconds. Fortunately, the initial drift was to the left, and there was no collision.

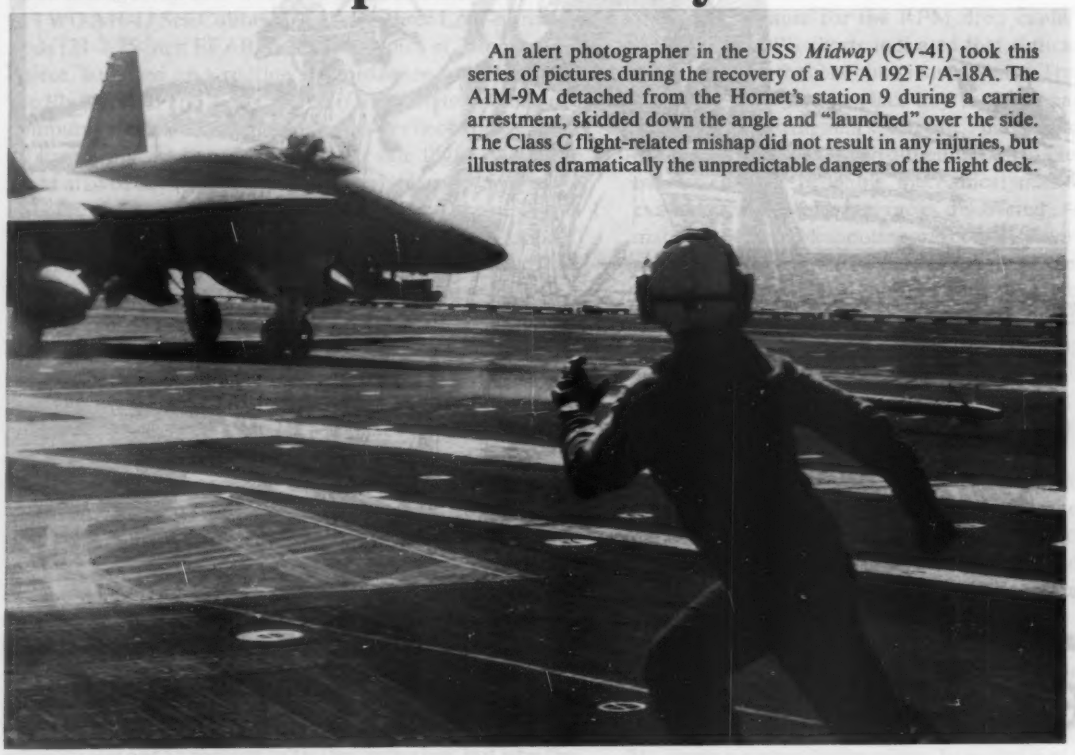
All the briefing in the world is useless unless it is followed. Any glitch or technical malfunction during execution of maneuvers or flight tasks require extra caution from each member to ensure that nothing is done that is unexpected or confusing. Often it is best to just hold what you have for a few seconds and clarify the situation. Is it really the way you think it is? If something is briefed, do it that way.

Creativity has its place, but not following the game plan will only produce situations that leave various members of the flight wondering what is going on or not knowing what another plane is about to do. Use that valuable brief time to ensure that each participant understands the complete sequence of events that will occur during the flight and the possible problem areas for any evolutions that require higher aircrew workload or that are inherently difficult. A simple rendezvous and lead charge is not normally considered a high workload evolution. Based on the number of mishaps and potential mishaps experienced in this flight regime, it probably should be. Simply stated, "Brief it and then fly it as briefed."

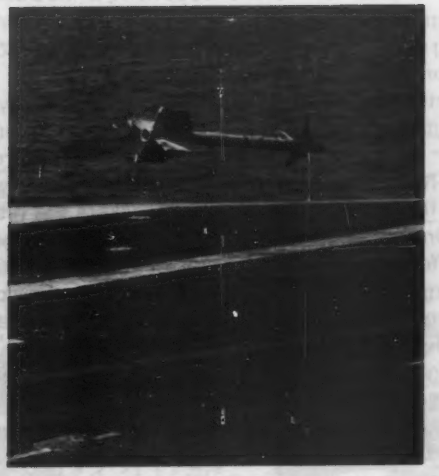
Lt. McLeod is currently line division officer for VA 46.

Going, going, gone. . . !

'Winder Waltz: A Different Kind of Weapons Delivery



An alert photographer in the USS *Midway* (CV-41) took this series of pictures during the recovery of a VFA 192 F/A-18A. The AIM-9M detached from the Hornet's station 9 during a carrier arrestment, skidded down the angle and "launched" over the side. The Class C flight-related mishap did not result in any injuries, but illustrates dramatically the unpredictable dangers of the flight deck.



Photos by PH2 Matthew Mahon.

Crew Communication

By Capt. W.M. Burgess, USMC

"NEVER take crew coordination for granted simply because a pilot is senior or has all the designations." I heard this warning during numerous safety stand-downs and briefs, but it had never hit home — until one particular night, when it hit home — almost literally.

I was scheduled for an NVG (night vision goggle) ordnance flight leading a section of AH-1Js. One requirement for the sortie was to navigate either to or from the target on the goggles. Our mission plan was simple: My aircraft would lead to the target, deliver the ordnance and accomplish a lead change. Dash 2 would lead home.

While delivering the ordnance, we selected a race track pattern with 180-degree separation between aircraft. My aircraft went Winchester first and decided to hold, clear of the ordnance pattern, while Dash 2 made another run on the target. Once Dash 2 went Winchester, the lead change was effected.

At this point I asked my copilot, who had 3,000 plus hours, if he wanted me to take the controls while he deselected all armament switches and circuit breakers. He responded, "Stand by. Wait until we get joined up." I saw the lead pass our 7 o'clock and relayed that fact to my copilot. He then assumed that I was taking the controls.

The aircraft was trimmed so it initially flew a perfect rendezvous **with no one on the controls**. Finally, the nose began to fall rapidly, increasing the closure rate. I knew the rate was excessive; however, I didn't question what he was doing. I figured that surely a pilot with over 3,000 hours would be able to effect a safe join-up. Perhaps he was thinking the same; for at the last possible moment, we both realized what was happening and recovered at approximately 50 feet, narrowly missing our wingman as we flew under him.

Had I been flying with an inexperienced or junior pilot, I would have expressed my concern at the onset. The point is, *never* hesitate to question something a pilot is doing. *Never* forget basic crew coordination concepts. Finally, *never* take crew coordination for granted simply because a pilot is senior or has all the designations.

Capt. Burgess is the aviation safety officer for HML 267, a composite squadron flying AH-1 and UH-1 helicopters.

Amphibious Cobra

By Joe Homer

TWO AH-1J Sea Cobras loaded with three LAU-68 rocket pods (21-2.75-inch FFARs) and 700 rounds of 20mm ammo apiece, launched on a routine, day ordnance training hop in the Philippines. The NATOPS brief and weight and balance computations were explicit and the hover checks proved that all was within gross weight limits for safe flight. When the flight arrived at the range, local fishing boats were within the boundaries. Range control was contacted, but the reply was that there was no range safety boat available for the Cobras' TOT. Consequently, the pilots, would have to "drive" the unwanted trespassers out of the range using procedures set forth in local range directives: a series of low passes.

The Cobras made several authorized low passes on the boats to shoo the fisherman out of the ordnance drop area. Cobra 1, having observed his wingman approach the boats from a hover, set himself up for a similar maneuver from the front seat. After establishing himself in a 10-foot hover, the Cobra began an unexpected descent as NR dropped to 84 percent. Unable to stop the descent, the pilot jettisoned the pods (only one fired) and blew the canopy prior to entry into the water.

The AH-1J remained upright in 15 inches of salt water for approximately a minute before the adept pilot milked the collective to increase NR sufficiently to lift the Cobra. Once airborne, Cobra I, escorted by Cobra II, limped back to homeplate where it was thoroughly inspected for possible malfunctions and corrosion. Parts and systems were meticulously cleaned to prevent saltwater corrosion, but why the aircraft settled into the water still remained unknown.

No direct cause for the RPM drop could be discerned. AH-1J NATOPS charts indicated that sufficient power was available under the conditions that prevailed. The approach was executed so as not to place any rapid demands upon the engines. The wingman's aircraft, under nearly identical conditions, experienced no difficulties when executing similar maneuvers. All probable mechanical malfunctions were examined with no discrepancies discovered. After complete maintenance troubleshooting and corrosion control, the most probable cause was listed as *undetermined loss of power.*

Since no mechanical malfunctions were identified, there must have been some other factors that caused the Cobra to settle unexpectedly into the water. Reviewing them could prevent future occurrences of helos inadvertently settling into oceans, seas and other bodies of water.

- Make sure that the aircraft is hovering or approaching into the wind.
- Both pilots should not direct their attention to the same object at the same time. One should monitor the guages while the other looks outside at the object of attention.
- Range safety boats and personnel should be in place before launch, whenever range regulations call for their presence.
- Instead of hovering in what could be "other than ideal" conditions, interpret "low passes" to mean minimum forward airspeed or single-engine fly away airspeed, whichever is higher.

Mr. Homer is a retired Marine aviator. He worked as an Approach writer from 1978 to 1980. He is currently the deputy director for physical security for U.S. Atlantic Fleet and U.S. Atlantic Command.

The Cost of Doing Business

By LCdr. Dave Parsons

A COUPLE of friends of mine died a few days ago. Their F-14 crashed while they were practicing an air show routine. Their deaths hit me hard.

At the Safety Center, we see a lot of statistics every day, from motor vehicles to hazardous materials to groundings to aircraft mishaps. Over time, you get callous. The Navy and Marine Corps lose 70 aircraft in an average year. You can't get emotional over every mishap. So, for pure emotional survival, you gradually distance yourself from the mayhem.

But this particular mishap sliced through my armor. These guys were friends, shipmates. They were good. We don't know why it happened yet, but all that matters to me is that it did happen. Scratch one F-14 and two outstanding men, guys you wouldn't expect this to happen to. That makes it even harder.

If it could happen to them, it could happen to *anyone*.

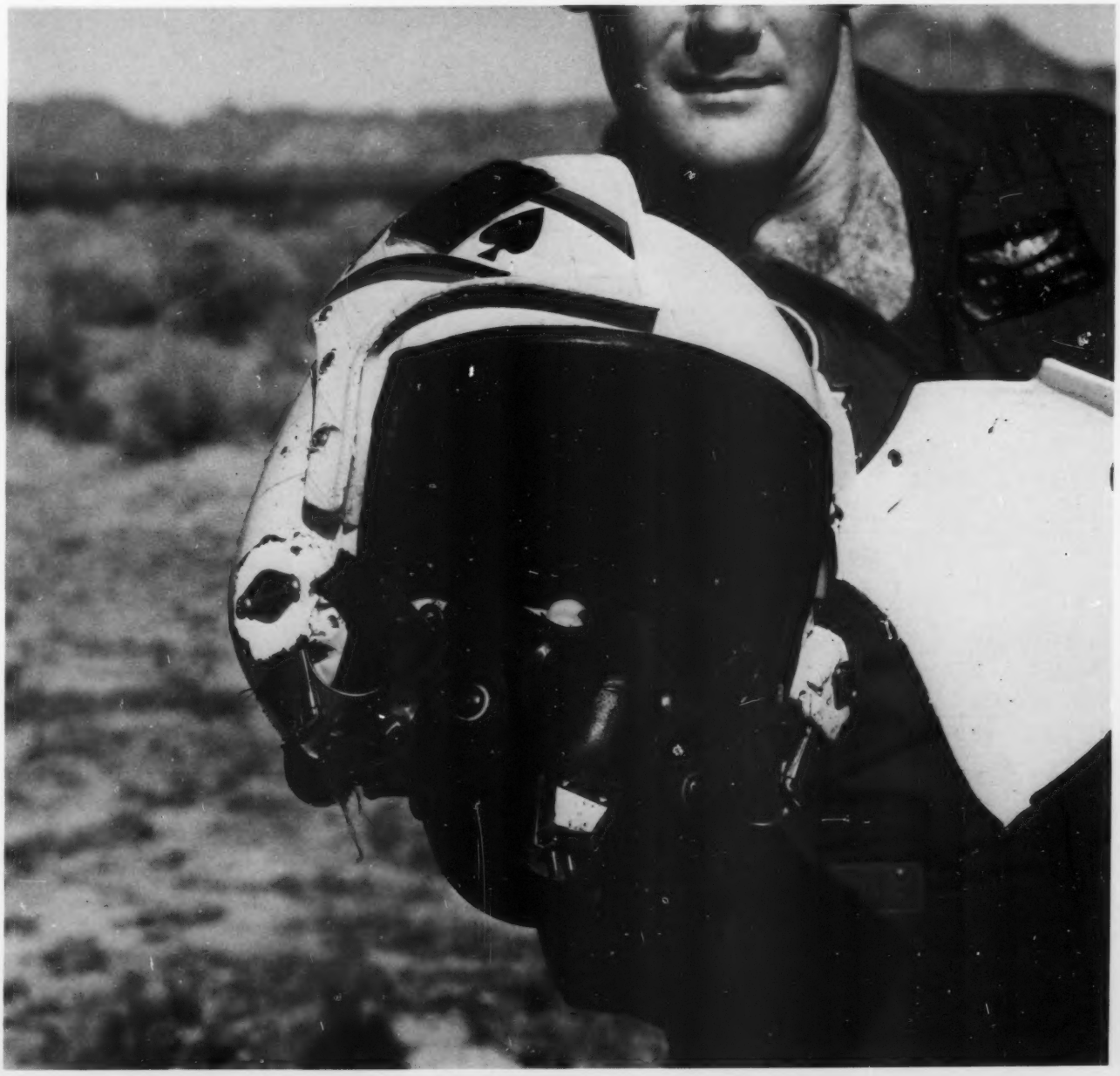
We know that aviation is a hazardous business. No matter how hard we try to prevent them, mishaps inevitably occur. We've reduced the annual number of Class A mishaps from a high in the 1950s of over 300, to our current average of 70. Some people believe we've gone about as far as we can in reducing mishaps while still maintaining our required level of operational readiness. This is what is commonly termed "the cost of doing business."

It's a valid precept and I subscribe to it. You have to justify your losses to those who examine budgets. But I just don't want to chalk these guys deaths up as part of the cost of doing business.

They weren't just statistics. They were people. And I am not the only one who will miss them. And if it *can* happen to them, it *can* happen to us.

Can we eliminate *all* mishaps? I don't think so. Can we accept that as policy? No. I don't want to become part of the cost of doing business. Neither do you.

GO AHEAD! DON'T WEAR YOUR VISOR!



Shoe
By Jeff MacNelly
Y'KNOW, IF YOU'RE EVER GOING TO BE A DECENT DUCK HUNTER...
..YOU'LL HAVE TO CHANGE YOUR ATTITUDE.
MODERN AIR COMBAT HAS GOTTEN MORE AND MORE COMPLICATED IN THIS COMPUTER AGE.
IT'S NOT ENOUGH ANYMORE TO BE A GOOD PILOT.
IN AN AGE WHERE YOUR ENEMY CAN SHOOT YOU DOWN WITHOUT EVER SEEING YOU ..
..YOUR SURVIVAL DEPENDS ON YOUR "COUNTERMEASURES"--
YOUR ABILITY TO MESS UP THE ENEMY'S RADAR.
THE MODERN FIGHTER PILOT CAN CHOOSE FROM A VAST ARRAY OF HIGHLY SOPHISTICATED ELECTRONIC JAMMING DEVICES...
BAM
..WHICH CAN BLIND THE ENEMY BY FOOLING HIS RADAR AND HIS MISSILE TRACKING SYSTEMS...
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1-23
DEPENDING ON HOW ADVANCED YOUR ENEMY IS.
BLAM
LUCKILY, IN THIS THEATER OF OPERATIONS...
MUD WORKS JUST AS WELL.
MACNELLY